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Original Communications.

THE TREATMENT OF GOUT.

READ BEFORE THE SECTION ON THERAPEUTICS AT THE PAN-AMERICAN MEDICAL CONGRESS.

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THAT there can be no rational treatment of gout without a correct understanding of its pathology is evident. It cannot, on the other hand, be claimed that the pathology of gout is thoroughly understood, although all admit that many facts bearing on it are well determined. One of these is that uric acid is in some way causative. Whether, however, the uric acid thus responsible is the result of increased formation or diminished excretion, or both, is not so generally acknowledged. Thus, Garrod, whose work, first published in 1859, is to-day regarded as one of the classics in medicine, held that there is no increased formation of uric acid in the gouty, but a diminished excretion, which results in an accumulation in the blood and other fluids of the body, and that this is true of almost every phase of gout. Such accumulation Garrod showed by his well-known thread-test. Although the methods of analysis employed by him were not those acknowledged at the present day to be the most

reliable, the more recent work of Pfeiffer, conducted in accordance with modern methods, essentially confirms the original statements of Garrod. Thus, Pfeiffer,* using Wolkowski's method, determined the uric acid in the urine of certain cases of gout, of which he made two classes. Of these, the cases of the first category had not passed over into the chronic stage,—that is, had not acquired changes, such as stiffness of the joints, gouty tophi, atheromatous blood-vessels, and the like,—but had suffered acute attacks with intervals of complete freedom from symptoms. The second category included cases which had undergone the changes referred to. His results he contrasted with those of the urine of healthy men at corresponding periods of life, as follows: In Class I., in which the urine of the exempt period was examined, the quantity of uric acid in the twenty-four hours per one hundred kilogrammes of body-weight was:

Age.	In gouty subjects. Gramme.	In healthy men. Gramme.
From 30 to 40.....	.885	.965
From 40 to 50.....	.818	.882
From 50 to 60.....	.701	.....
From 60 to 70.....	.661	.752

It will be seen that the excretion was less in the gouty subject than in the healthy man in Class I. The same was true of the urea, which amounted to only 28.8 grammes in gouty subjects for each one hundred kilogrammes of body-weight, instead of an average of 33.1 grammes or each one hundred kilogrammes in the healthy men, observations being made on men from thirty-three to sixty-five years old.

Thus it will be seen that in the urine of such cases in the intervals between attacks there is a very decided diminution in the quantity of uric acid eliminated as compared with persons in health.

In Class II., those in whom chronic gouty changes had established themselves, Pfeiffer noted a somewhat different result. Thus, while the average elimination of uric acid in a healthy man from thirty-three to sixty-five years old was .860 gramme, that of the gouty subject between thirty-three and sixty-five years amounted to .973 and even more, while the ratio of the urea to uric acid, which was 33.7 for the healthy person, amounted for the gouty to 35. Thus, in this class of cases—the gouty with chronic changes—there is an *increased* excretion of uric acid as compared with health. This is a reversal of the original results of Garrod, who found in the urine of this class of gouty subjects no uric acid at all, or only traces. This is ascribable to defect in the older method of analysis,—that of Heintz, by hydrochloric acid. It is now known that this fails to get out the whole of the uric acid.†

It will be seen, however, that the difference in favor of increased excretion is very slight, while the average excretion in the two classes of cases between thirty-six and seventy-three years old is still a trifle less than in the non-gouty, being .855 as compared with .860, while the urea is also somewhat less, being 31.3 instead of 33, the ratio of urea to uric acid being 36 to 1, as contrasted with 38.5.

Now, if we turn to another modern observer, Alexander Haig,‡ who also used Wolkowski's method for the determination of uric acid, and whose work seems to have been done with unusual care, we find his studies entirely confirm the original results of Garrod. Haig claims that there is "almost never" an excessive formation of uric acid at any time, and that its accumulation in the blood and body is generally due to retention or failure of excretion; that uric acid is, on the whole, continuously formed in the proportion of 1 to 33 of urea. In certain states of the blood, constituted essentially by increased alkalinity, uric acid is held in solution in larger quantity, constituting uric-acidæmia. At such times, too, it is eliminated in increased quantity by the urine, by which it is also readily held in solution because of the alkalinity of this secretion. In opposite states of the blood the uric acid is driven out of this fluid and deposited in the tissues of the joints. Haig holds, also, that these opposite conditions, which are fluctuations in secretion only, can be artificially produced by drugs, food, temperature, and other conditions influencing the reaction of the blood. Thus, alkalies, alkaline foods, and warm weather favor the former, while acids and cold weather favor the latter, and it is under influences like these that uric acid in the shape of urates is stored up in the body. He further says § that the blood never becomes loaded with uric acid except as the result of previous imperfect excretion,

* "Ueber Harnsäure und Gicht" (*Berliner Klin. Wochenschrift*), No. 17, April 25, 1892, s. 415).

† Pfeiffer says that this *in*disposition of uric acid to be thrown down on the addition of hydrochloric acid, formerly regarded as characteristic of gout, becomes more marked as age advances, and may be said to be almost the rule with persons over sixty. Possibly, says Pfeiffer, it may present itself earlier in gouty subjects than in the normally constituted.

‡ "Uric Acid as a Factor in the Causation of Disease," by Alexander Haig, London, 1892.

§ *Op. cit.*, p. 7.

and such imperfect excretion or retention is sufficient to account for the largest quantities he has ever seen in the human body, and that it is not necessary to suppose excessive formation in explanation. Further, that he does not assert that such formation never occurs, only that he has never met any conclusive proof of its occurrence, while all the phenomena of disease can be explained without postulating the excessive formation of a single grain.*

The ultimate result is, however, the same. Whether it be from diminished excretion or increased formation, or both, there is an accumulation of uric acid in the blood, which is responsible, first, for certain premonitory symptoms of gout, and, second, for certain local symptoms. The latter are of an inflammatory nature, and consist essentially in pain, swelling, and redness of the joints, preferably of the smaller ones, and especially of the metatarso-phalangeal articulations of the great toe; more frequently, perhaps, of the left great toe.

It may be worth while to dwell a moment on the relation of the uric-acid compounds to the local inflammation. It is scarcely necessary to say that uric acid does not exist as such in the blood, even in pathological conditions. The normal urates, as originally shown by Bence Jones, and recently confirmed by Sir William Roberts, are quadri-urates. In the pathological state these are converted into the less soluble bi-urates which make up the local deposits. It has all along been considered that these deposits are the direct cause of the gouty inflammations. Haig, as the result of his recent researches, reasserts this view in the following graphic language: †

"Then I also noticed that in curing a headache by giving an acid to diminish the excretion of uric acid, I always produced a certain amount of pricking and shooting pain in my joints (generally in those which had been most used on the day in question), and it naturally occurred to me that the uric acid was held back in these joints and produced the pains. The uric acid which had failed to appear in the urine must have gone somewhere. What more natural than to suppose that it had been retained in the joints (where in gout it is found), and that the pricking pains were the evidence of its presence?

"Then, on turning to Sir A. Garrod, I find that he had described precisely similar joint-pains as occurring in gouty subjects immediately after the ingestion of beer or wine, and a very little investigation sufficed to prove that all wines and beers are strongly acid, so that a very simple explanation could be given of the facts."

In striking contrast to these heretofore acknowledged views are those recently announced by Pfeiffer, based on experiment and confirmed, he believes, by clinical facts. He introduced under the skin chemically pure crystallized uric acid, suspended in water, with absolutely no immediate results. In the course of twelve to eighteen hours, however, as the uric acid began to be dissolved, irritation and skin inflammation presented themselves. These symptoms were further totally prevented if large doses of mineral acids were introduced into the body, by which solution of the uric acid was presumably prevented, while the use of alkalies caused them to set in earlier and with greater intensity. So, also, the phenomena of irritation presented themselves earlier if the injection of uric acid was immediately followed by the introduction of alkaline solutions in the same locality. Again, pain and inflammation appeared promptly if *solutions* of uric acid are injected. The results of these experiments are also in accord, says Pfeiffer, with the clinical fact that the tophi of gouty patients are usually painless; often, indeed, they form without the knowledge of the patient. Not the precipitated uric acid, therefore, but the dissolved uric acid, according to this view, must be regarded as the irritating agent. According to it, also, an acute attack is the result of a re-solution by the blood of previously-deposited uric acid, the impulse to this re-solution being an increased alkalescence of the blood and body juices, while the deposit is the result of diminished alkalescence. Pfeiffer, in further support of this view, calls attention to the fact that the most recent chemical analyses by Lecorché, Ebstein, and himself show that the excretion of uric acid *during* an attack of gout is increased and not diminished, as taught by Garrod. I can, of course, have nothing to say of Pfeiffer's ex-

* Notwithstanding these observations, it is not unusual to find even medical men under the impression that gouty subjects excrete much more uric acid than the healthy, an error probably due to the fact that the urine of gouty subjects is apt to contain large *sediments* of uric acid, especially during acute attacks, whence is erroneously inferred increased *excretion*.

It should be mentioned that in a communication to the Tenth Congress of German Physicians, so recently as 1892, Mordhorst, of Wiesbaden, also asserted that the average of the entire uric-acid excretion of the gouty is *considerably* greater than in the rheumatic and healthy. These results are ascribed by Pfeiffer to the careless selection of material for the observation and defective methods of analysis.

† *Op. cit.*, p. 2.

periments; but, so far as the clinical facts which he adduces to prove his position are concerned, my own experience is not in accord with his.

The most recent studies on this subject—those of Sir William Roberts, embodied in the Croonian lectures and just republished in a small brochure, entitled "Uric-Acid Gravel and Gout"—reaffirm the older view, that the "mechanical theory offers a natural and complete explanation. The crystalline urates precipitated in the cartilaginous and fibrous structures of the joints necessarily act as foreign bodies; they excite irritation, clog the lymph-channels, exercise pressure on the tissue elements and impede their nutritive operations. These effects sufficiently account for the inflammation, pain, and swelling which ensue, and explain the remoter degenerative changes which follow" (p. 111).

TREATMENT.—We are now ready for a rational treatment of gout. Whether it be an irritant in solution or an irritating precipitate, uric acid is its cause; hence whatever diminishes the amount of uric acid in the economy must tend to relieve gout. It is plain, also, that we may diminish uric acid in two ways: first, by confining the gouty person to such food as produces a minimum of uric acid; second, by administering such medicines as will promote its solution and elimination. The first of these constitutes, in the main, the *dietetic* treatment, the second the *medicinal*.

1. *The Dietetic Treatment.*—I have said the elimination of urea- and uric-acid-producing substances from the dietary constitutes the dietetic treatment, which is by far the most efficient of the treatments of gout, without which all else is only palliation.

This consists essentially in the elimination from the food of all nitrogenous or albuminous principles, which are they whose complete combustion results in urea and incomplete combustion in uric acid. As to these there should be no half course. They ought to be excluded as far as possible from the dietary. I say as far as possible, for it is practically impossible to eliminate them altogether. The foods which are the type of this class should, however, be altogether omitted. Such are the meats of the butcher-shops, the albumin of eggs, and the cheeses. The first include beef, veal, mutton, lamb, and pork, whether salt or fresh, and for the most part fish. As to cheeses, as a half-pound of cheese contains almost as much nitrogenous matter as a pound of beef,—twenty-seven per cent., when made of the whole milk and twenty-eight per cent. when made of skim-milk,—it is plainly contraindicated. If we consider only the edible parts of beef,—*i.e.*, meat deprived of the refuse represented by bones, skin, and shells,—it contains, according to its source, seventeen to twenty-three per cent. of proteids; mutton, from fifteen to eighteen per cent. Of fish, flounder contains 13.8 per cent.; mackerel, eighteen per cent.; halibut, fifteen per cent.; and salmon, twenty-one per cent., or quite as much as beef and more than mutton. Salt cod-fish contains fifteen per cent.; smoked herring, twenty per cent.; and canned sardines, twenty-four per cent. Poultry contains fourteen to fifteen per cent. of albuminates and game twenty-two per cent. The hen's egg, including albumin and fat, contains 13.7 per cent. of protein, whence it is plain that the yellow of eggs contains a very small quantity and becomes a suitable food.

On the other hand, milk contains but three per cent. to four per cent. of protein; butter, one per cent.; and oleomargarine, .6 per cent. The fat oyster contains eight per cent. and the lean 4.2 per cent., and the lobster 5.5 per cent.; other fish than the above mentioned, five to ten per cent.

Of vegetable foods, wheat bread contains 8.9 per cent. of protein; wheat flour, eleven per cent.; and Graham flour, 11.7 per cent.; rye bread, 6.7 per cent.; buckwheat flour, the same; corn (maize), nine per cent.; rice, 7.4 per cent.; sugar, .3 per cent.; potatoes, two per cent.; sweet potatoes, 1.5 per cent.; turnips and carrots, one per cent.; cabbage, 1.9 per cent.; melons, one per cent.; apples and pears, .4 per cent.; and bananas, two per cent. Again, beans contain 23.2 per cent. and oatmeal twelve to fifteen per cent., large proportions of proteids.

Thus, the typical foods permissible from the stand-point of composition are milk, butter, the succulent vegetables, except beans and oatmeal, and fruits. To these oysters and lobster may be added moderately, fish, except those named as containing a large amount of protein, and where extreme rigidity is not required, poultry in moderate amount; but all butcher's meat should be strictly forbidden.

It is usual, also, to interdict the use of carbohydrates,—*i.e.*, starches and sugars,—as well as the hydrocarbons—fats and oils—but I have never been able to see any reason for this. There is absolutely none from the stand-point of chemical composition, since they are totally without nitrogen, and, so far as my own experience goes, no cause from the clinical stand-point. Only in the event of their producing indigestion and fermentation, with the genera-

tion of acids, can they become a cause of gout, and then only, I should say, an exciting cause. I am in the habit, therefore, of permitting the use of rice, potatoes, and other farinacea, and, to a reasonable extent, sugar.

I am glad to be able to say that I am sustained in this view by Sir William Roberts, who, in the brochure just quoted, says, also, "The most trustworthy experiments indicate that fat, starch, and sugar have not the least direct influence on the production of uric acid; but as the free consumption of these articles naturally operates to restrict the intake of nitrogenous food, their use has indirectly the effect of diminishing the average production of uric acid."

Basing his conclusions upon experiments with solutions of blood-serum impregnated with common salt (.1 per cent.), in which he found the precipitation of crystalline biurate always appreciably hastened, Sir William Roberts for some years past has directed the gouty to restrict as far as possible the use of common salt with meals. On the other hand, Sir William recommends that the subjects of uric-acid gravel should be advised to take habitually with their meals as much culinary salt as their palates will tolerate.

There are, however, other sorts of ingesta, also entirely or almost free from nitrogen, acknowledged to be both a predisposing and exciting cause of gout,—namely, malt liquors and wines. These are composed of water, alcohol, carbohydrates, and a trace of mineral matters, but no nitrogen. It is not easy at first thought to understand why these substances should be harmful. Experience, however, shows that the stronger wines, such as port, Madeira, and sherry, by their continued use, are very likely to produce gout, while the lighter wines, —the clarets, hocks, and Moselle wines,—if taken in moderation, rarely produce it. After these, stout, porter, and the strong ales induce gout. Even lager beer, which contains but three per cent. of alcohol, is capable of acting similarly, and I know many men who have been forced to give up this beverage because of this effect. Cider and perry least of all beverages predispose to gout. On the other hand, distilled spirits, especially whiskey, are almost entirely without effect in producing gout. Why is this? Apparently, the amount of alcohol is not the measure of the effect, for whiskey, gin, brandy, and rum all contain more alcohol than any of the wines alluded to. If reference is made to the wines most apt to produce gout, it will be found that they are those which contain a considerable quantity of both sugar and alcohol. Such are port, sherry, and Madeira, all of which contain more than fifteen per cent. of alcohol and much sugar; also sweet champagnes containing eleven per cent. of alcohol. On the other hand, some very sweet wines, as Tokay, Malaga, and the higher Sauternes, which contain much sugar, produce gout less rapidly. It would seem that those liquors which contain alcohol in combination with other substances, especially sugar, are potent gout-producers, especially where they excite indigestion.

As to the acidity of alcoholic drinks, their influence is pretty clearly as exciting causes. In this way act the beers, in which both alcohol and sugar are present in small amount, but which are highly acid. An explanation of this fact is less ready from the stand-point that the acute attack of gout is due to a resorption of the deposited uric acid by an alkaline blood, than on the supposition that the attack is due to the irritative effect of uric acid deposited in the joints, because of the diminished alkalinity of the blood induced by the absorbed acid. Whatever be the explanation, few facts in the clinical history of gout are better established than that the ingestion of acid is an exciting cause of attacks.

In the same way act acid fruits, such as strawberries, acid oranges, and lemons. On the other hand, to such influence I have known the most divergent response. Thus, a gouty patient of my own could bring on an attack by drinking a single glass of lemonade, while a gouty friend would drink a pitcher of lemonade at dinner without any effect whatever. It is to be remembered that the otherwise harmful effects of the strong distilled spirits, such as are well borne in gout, are no less serious in gouty subjects than in others, and are often induced by the careless prescription of whiskey as less harmful than wines in gout.

2. *The Medicinal Treatment.*—From the earliest history of the disease practice has recognized two classes of remedies in the treatment of gout,—alkalies and purgatives,—the object of both being to eliminate the offender, the first by producing soluble combinations which pass off readily by the kidneys, the second to carry it off by the bowels. It is plain that a combination of the two principles might be expected to be more efficient than either one alone.

First, as to alkalies and alkaline combinations. My experience places the salicylate of sodium easily at the top, and while it is not so rapid in its effect in relieving the pain of an acute attack of gout as it is in rheumatism, it is

nevertheless an invaluable remedy, excelling all others. During an attack it should be given in doses as large as can be borne. As a rule, adult men easily bear 15 grains four times a day, or 10 grains may be administered every two hours. Even larger doses may be given with advantage if borne by the stomach.* With relief to the acute symptoms, the dose should be reduced; but, as in rheumatism, the remedy should not be discontinued, and between attacks smaller doses should be kept up for some time. These, however, may be substituted by the natural mineral waters to be presently alluded to.

After the salicylates, the alkaline carbonates have always held a high position in the treatment of gout. Half an ounce a day should be the initial dose, reduced with relief to the acute symptoms, but continued. It may be combined with a little lemon-juice, to improve the flavor, or the citrate of potassium may be given in the same doses.

The lithium compounds—the carbonate and citrate—have not proved so useful as to cause me to prefer them to salicylic acid. Indeed, the early results of Garrod with them cannot be said to have been realized in modern therapeutics. Sir Dyce Duckworth says of lithia that it is a remedy better adapted to the chronic than the acute phases of gout. Five grains four times a day, freely diluted, is the dose usually administered, and with this the potassium salts are sometimes combined.

A most valuable adjuvant to the medicinal treatment are mineral waters. The waters which have heretofore received almost universal approval are the alkaline waters, although those possessing purgative properties also enjoy much reputation. In America, however, few of these waters are native, while those which are are so far inferior to the foreign waters that it is practically impossible to fulfil these requirements with native waters alone, while the costliness of the foreign waters imported to this country contributes a very serious obstacle to their use. As a consequence, the native waters which have been employed and highly vaunted by their owners on apparently insufficient grounds are of the kind known as negative waters,—that is, they have no mineral ingredients in any quantity to justify their classification in any of the four principal varieties of mineral waters,—viz., the alkaline, the saline, the purgative, or sulphurous,—or on which to base any therapeutic results except by their diluent effect. At the same time it has been noted that these waters are not without effect in relieving gouty symptoms. Reasoning from these facts, I have long been in the habit of prescribing native negative waters, such as are accessible to the patient, or distilled water, with this end in view,—the simple diluent and solvent effect which comes from an increased proportion of water. The further propriety of such a course is found in the fact that gouty and lithæmic patients are often small water-drinkers, never drinking water between meals and very little at meals. To such eight ounces of water ordered on rising, between meals, and at bedtime will often clear off a dark-hued urine of high specific gravity and substitute a light-hued, clear urine, without any sediment.

The actual mineral waters which have acquired the greatest reputation in the treatment of gout are those of which sodium bicarbonate is the chief ingredient, to which the calcium bicarbonate is regarded a valuable adjuvant. Such are the alkaline waters of Vals and Vichy in France, Evian-les-Bains in Switzerland, Neuenahr and Fachingen in Prussia, Contrexville and Vittel in the Vosges, France, and Dax in France. Other waters possessed of reputation in the treatment of gout, in which the quantity of alkaline bicarbonate is smaller, owe it to their combined alkaline and aperient properties, chiefly due to sodium sulphate and magnesium sulphate, and belong to the second category of remedies for the treatment of gout. Such are the alkaline and saline waters of Carlsbad and Marienbad in Bohemia, Kronthal in Nassau, and Brides-les-Bains in Savoy. Then there are the saline waters represented by Baden-Baden, Ems, Homburg, Kissingen, Wiesbaden, and our own Saratoga waters and those of Bedford, Pa. Finally, there are the bitter acidulated and purgative waters,—Hunyadi Jaños and Friedrichshalle in Hungary, Pülna in Bohemia, and Rubinat in Spain,—rarely resorted to for gout, but useful as eliminating agents.

* In this connection I desire to call attention to the method of administration of sodium salicylate by the rectum. 1. The rectum is cleared out of fæcal masses, preferably by warm water, and some time allowed to elapse after this before the drug is injected. 2. From ninety to one hundred and twenty grains of salicylate of sodium are dissolved in three fluidounces of warm water, to which twenty-five minims of tincture of opium have been added. 3. A three-ounce syringe, with a long soft gum tube attached to the nozzle, is filled with the solution, the gum tube introduced about eight inches into the bowel, and the injection made, *once daily*. 4. After the injection the syringe is withdrawn from the gum tube, which is allowed to remain in the bowel, the syringe filled with air, and this forced into the tube in order to retain the enema. The precaution must be taken of informing less intelligent persons that the injection is to be retained.

The use of these mineral waters is especially indicated in a continuous manner between the attacks, with a view to averting them. Especially useful are the thermal waters in the chronic arthritic complications, in which their internal use is combined with bathing. In this connection may be mentioned Carlsbad and Marienbad, where also the mud-baths are employed, Baden-Baden, Ems, Wiesbaden, Hammon R'Irha in Algeria, available in winter, Plombières in the Vosges, and Dax in France. Homburg and Kissingen are also resorted to for their baths, although the waters are cold.

Sulphurous waters also have some reputation in gout. Especially is this the case with the waters of Aix-la-Chapelle in Rhenish Prussia and Aix-les-Bains in Savoy, Harrogate in England, Richfield Springs, Sharon, and St. Catherine's in America. In all these places the bath treatment is an important adjuvant.

The second category of remedies—the aperients—are decidedly useful in gout, both as eliminators and to prepare the way for the absorption and prompt action of the alkaline bicarbonates. They are not, however, used at the present day as freely as a century ago, and they are commonly reserved for the acute attack.

Among the eliminating remedies is the time-honored colchicum, a drug which is of undoubted value in gout, but which, in my experience, must yield the palm to salicylic acid. For a long time its action was inexplicable, and it came to be spoken of as a specific in gout, as quinine in chills and mercury in syphilis. Modern studies have, however, solved this problem. Professor Rutherford has shown that it is one of the most powerful cholagogues known. This, taken in connection with what we now know of the office of the liver in urea formation, simplifies very much the solution of the problem. This explains, too, why colchicum produces its sedative and anæsthetic effect without necessarily producing purgation. Indeed some, as Sir A. B. Garrod, consider that its effects are best attained without purgation, and Garrod says that if cathartic action is required, it is better to combine some aperient with the colchicum, as when much purging and vomiting result from colchicum, nervous and vascular depression follow. I confess I like to secure a little action on the bowels by increasing the dose gradually, and it is not necessary to produce either violent purging or vomiting.

The preparation commonly used is the wine. In this country the wine of the seeds is no longer official, so that if the wine is ordered that of the root is dispensed. This is more powerful than the wine of the seeds. The dose of the latter is from ½ to 1 drachm or 1½ drachms during the attack, but of the root 15 to 30 minims, reducing the dose when nausea or purgation ensues.

The acetic extract of colchicum was a favorite preparation of the older physicians, especially Scudamore, who introduced it, and who considered its action milder than any other form. It is still sometimes used, and has the advantage that it may be put into pill form. Its dose is 1 to 2 grains.

I am not in the habit of using colchicum in the interval between attacks of gout, and indeed use it less in the acute attacks since the salicylates have come into use, but still value it highly. Colchicum has also been regarded as a diuretic, but later observations go to show that it does not increase the elimination of uric acid or urea. It should not be omitted that some of the physicians of the third quarter of this century who had large experience with colchicum thought it caused gouty attacks to become more frequent, but Garrod and Sir Thomas Watson, whose combined experience is probably greater than that of any other two men, both deny it. It may be worth while to add here what the latter said of its efficiency: "This drug has certainly the property of easing in an almost magical manner the pain of gout." "How it operates," he says, "is not so clear." We have seen that at the present day, however, a rational explanation is not wanting. Colchicene, the active principle of colchicum, is also employed. Its dose is $\frac{1}{50}$ grain. The same dose may be employed hypodermically. The fluid extract of colchicum may be administered in doses of 2 to 6 minims.

The aperients commonly used in gout are the salines, of which the magnesium sulphate is the favorite. Sodium sulphate is also used, and it is the constituent of the most actively purgative mineral waters,—the Hunyadi Jaños and Friedrichshalle mineral waters,—already mentioned, which are now largely used instead. A favorite combination of the older physicians was magnesium sulphate two drachms, magnesium carbonate a scruple, suspended in an ounce of cinnamon-water, two or three times a day, until active purgation results. These two substances may be combined with colchicum, and with it make one of the forms of Scudamore's mixture, a popular gout medicine.

Colocynth is also employed as an aperient in gout, and advantage has been taken of this fact in the preparation of the secret remedy

known as Lavelle's tincture, which is very largely used by the laity, and which undoubtedly has a very prompt effect in many cases of acute gout.

The following has been published* as the composition of Lavelle's remedy, as determined by analysis:

	Parts.
Quinine	5
Cinchonine	5
Colocynthin	2.5
Lime salts	5
Water	85
Alcohol	100
Port wine	800

Doubtless it will be expected of me to make some allusion to a remedy which has recently been introduced as efficient in the treatment of gout. I allude to *piperazin*. I regret to say that I have been disappointed in it. In my early trials I thought it useful, but soon learned that it was less efficient than the salicylates and colchicum. An acknowledged solvent for uric acid, when dissolved in water, its failure as a uric-acid solvent in the system is well explained by some recent experiments by Dr. Martin Mendelsohn, who placed small uric-acid gravel in a one-per-cent. aqueous solution of piperazin, in urine containing one per cent. of piperazin, and in urine derived from a person during the administration of uric acid. The first solution produced a decided effect upon the stone, reducing its bulk one-half and liberating parts of the organic framework, but the stone in the second and third solutions remained uninfluenced. Mendelsohn further placed on a filter a known quantity of uric acid, and passed over it the urine of a person who had taken 2 grammes of piperazin in the course of a day, and found that at the end of this time the uric acid weighed more than it did before the urine passed over it, so that instead of dissolving away the uric acid something additional was added to it.

It will be remembered, too, that Pfeiffer has shown that it is one of the peculiarities of the gouty diathesis that the urine possesses a marked "precipitability" for uric acid,—that is, it parts with its uric acid with great readiness,—and it possesses, further, a disposition to give off uric acid to the uric-acid filter above described in an especially high degree,† and that under the use of certain mineral waters, as those of Vals or Fachingen, the urine loses this property. Now, if piperazin is an efficient agent to the end claimed, it ought to produce the same effect on the urine as the mineral waters referred to did. In very carefully conducted experiments, however, Mendelsohn showed that this was not the case. So that it is true of piperazin, as of other substances, that while in aqueous solution it dissolves uric acid, there is something in urine which interferes with this solvent power.

For the relief of the acute attack of gout, leeches, blisters, and cold have all been discontinued of late years, not only because they are useless, but also because their use has been followed by fatal attacks of the so-called internal gout. Warmth and moisture do, however, have a mollifying effect, which is increased if the liquid preparations of opium be associated. Cocaine, which might be expected to be useful, operates only through open surfaces.

All pressure by boots on joints disposed to gout should be carefully avoided, as well as injuries, as such influences undoubtedly act as predisposing causes. Muscular and mental fatigue are existing causes of acute attacks, and should be avoided by the gouty.

* *Druggist's Circular*, October, 1889.

† This property is possessed, according to Pfeiffer, by the urine of all healthy men, but not by that of women or children, but by gouty persons or those possessed of the uric-acid diathesis in an eminent degree.

VENESECTION IN THE TREATMENT OF ENGORGEMENTS AND DILATATIONS OF RIGHT SIDE OF HEART.

READ BEFORE THE SECTION OF THERAPEUTICS OF THE PAN-AMERICAN CONGRESS.

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UPON no point in therapeutics was there more settled conviction in the minds of medical men in the first half of the present century than in the matter of bloodletting. Open the works of almost any of the great medical lights of that period and one finds the testimony in its favor never uncertain, never equivocal. In one form or another it was easily the sheet-anchor of the remedial art. Yet a single generation—nay, even a decennium—saw it fall into disrepute, almost into complete desuetude. It is not my intention here to consider the influences that brought about this astonishing change, this unhesitating rejection of the experience of centuries, this discredit of the opinions and conclusions of those who in many respects still claim our reverence and admiration. It is an old story (and has its analogues in many phases of the history of our race) of a good thing abused, perverted, and misapplied, until turned into an instrument of such malignant power that the evil springing from it, for

a time at least, quite hid its true merit. So completely has general bloodletting fallen into disrepute that it may be said safely that a majority of the medical men of the present generation have never seen, much less done, the operation of venesection. Yet throughout these years of its humiliation there have never ceased to be those who have held up the standard of venesection, though, for the most part, in so half-hearted, timorous a fashion that they have rather weakened their cause by the feebleness of their defence. There has been some sign, of recent years, of a disposition to reconsider the therapeutic claims of venesection in a judicial spirit, and from a clinical, not a theoretical, stand-point. Surely, at this date, partisanship and prejudice need form no factors in such a research, and although we can hardly expect a justification of the statement made so recently as 1860 by no less an authority than the late Professor George B. Wood ("Therapeutics and Pharmacology," etc., 1860, Philadelphia, vol. ii. p. 37), that there is no more important remedy than bleeding, perhaps none which so frequently saves life, it seems likely that we will find that our therapeutic predecessors were not so hopelessly in the wrong after all.

It is not my purpose to consider in this paper the general question of bloodletting. I intend to refer briefly to but one of its aspects; one, however, in which the indications for its employment are so clear, its beneficial effects so prompt, remarkable, even life-saving, that there remain hardly any grounds for discussion. I refer to the mechanical relief to be afforded an overtaxed, distended, and dilated right heart by the abstraction of blood. This procedure receives such abundant justification, both in theory and practice, that an apology might almost be expected for recommending it before such an assembly as this, especially since it has been advocated repeatedly with far more convincing argument than I shall be able to offer in this short paper, and more recently by Lafleur (*Bull. Johns Hopkins Hospital*, August, 1891) and Pye-Smith (*Med.-Chir. Transac.*, London, vol. lxxiv.). The revolt against venesection, however, has been so wide-spread and complete, that it is only by persistent advocacy that we may hope to see it rehabilitated, even in its most important applications.

Overfilling and incomplete emptying of the right ventricle may be brought about by any persistent obstacle to the free passage of blood from this chamber to the arterial circulation. Nearest the right ventricle the obstruction may be in the pulmonary circulation, as from bronchitis, associated with the diminished vascular supply consequent upon the atrophic changes of emphysema, etc., or it may depend upon defects of the mitral orifice and valve; finally, but only after secondary and relative incompetence of the mitral valve, alterations at the aortic orifice and valve may prove the exciting cause. Of these influences, the mitral changes have most potency, mitral stenosis more notably, for reasons that are obvious and not necessary to be designated here; but in consequence of the more frequent occurrence of mitral insufficiency, the latter lesion will be found to be the exciting influence in most cases.

Engorgement and distention of the right side of the heart are not very prone to occur so long as hypertrophy of the ventricle is able to supply an increased energy sufficient to afford compensation to the obstructed circulation in front of it. It is only after failure of this muscular hypertrophy has begun, and weakening of power with dilatation and increased capacity of the ventricular chamber have set in, that the condition we are considering is apt to arise. This usually occurs by a gradual development after long-standing and slowly augmenting valvular defect, but it not infrequently is precipitated by sudden intervention of obstruction in excess of that already present. The most important of these intercurrent processes may be located in the lungs, as from a pneumonia, a bronchitis, especially in the presence of old emphysema. However occurring, whenever this condition is encountered, venesection affords a remedial measure of remarkable power; but where the engorgement is the consequence of a rapidly developing obstruction to an already laboring right ventricle, its good effects appear at times to be almost magical. The clinical indications for venesection under the circumstances we are considering may be quoted from an excellent paper on the therapeutic value of venesection, by Dr. Pye-Smith, as "general venous congestion with arterial anæmia indicated by *cyanosis* with dyspnœa, turgid veins, swollen liver, albuminuria, pulsation in the jugular veins and at the epigastrium, functional incompetence of the tricuspid valve (sometimes indicated by a systolic murmur), and a weak, small, and fluttering radial pulse." The pathological chain of which these symptoms are the expression usually begins with an arterial anæmia having its origin in an unfilled or an imperfectly emptied left ventricle; unfilled, in consequence of an obstructed mitral orifice or an obstructed pulmonary circulation; imperfectly emptied, in consequence of an insufficient mitral valve. The blood, obstructed in

its onward passage in one or the other or all of these ways, banks up into the system of the right heart, the pulmonary artery, the right ventricle, the right auricle, and into the general venous system. The brunt of the struggle is with the right ventricle, which, unable to overcome the obstacle in front by its systole, distended during diastole by the increasing pressure of blood from behind, becomes overfull, stretched, incapable of orderly and vigorous contraction, and in immediate peril of succumbing to the burden thrown upon it. As the distention of this muscle increases, so does its power steadily diminish.

Many therapeutic measures are resorted to for the relief of this condition of passive engorgement, with greater or less success, but no measure will so safely, so pleasantly, so speedily, so frequently afford relief, even avert impending death, as the judicious practice of venesection. By it the torrent of blood is checked and partially diverted, the ventricle, relieved of the pressure, contracts, gathers force and rhythm, and relief, often but temporary, rarely permanent, is secured. Naturally, in many cases all remedies fail and the patient dies; in many, again, the relief is only transitory; but in a fair number, where the circulatory obstruction is acute, as in the sudden bronchitis that at times surprises an old emphysema with its resulting weak heart, the relief will be permanent. Taken altogether, I desire to claim openly that in the conditions above described, where the danger to the life of the patient is rapidly developed and imminent, the letting of blood offers greater chances of relief than any other remedy.

From a number of cases of successful venesection for the condition under discussion I have selected the following:

Mr. W., unmarried, forty years old, a builder and contractor, of medium height and robust frame. Mr. W. had had a healthy youth and early manhood. He never had scarlatina or diphtheria. Some rheumatic pains in the ankle-joint three years ago, but not severe enough to disable him. For years has been addicted to rather free alcoholic indulgence. He is of an active, energetic temperament. Was not thought to have heart-disorder until the preceding winter. He never fainted nor complained of palpitations. Early last spring had occasion to consult a physician on account of dyspnœa. He became orthopnœic and mildly cyanotic, and had very feeble and irregular heart-action. This condition lasted a number of weeks, and he slowly improved and finally resumed work. There was said to have been no albuminuria and no dropsy. He did fairly well until attacked by the prevailing influenza. This followed an ordinary course and left him with some bronchial catarrh. On January 8, 1890, he went out of doors, and on the 9th was seized with severe cough and dyspnœa. Symptoms of active pulmonary engorgement rapidly developed, and on the 11th, at 10 P.M., I was called to see him in consultation with Dr. L. McLane Tiffany. He was then sitting up in bed; livid; temperature, 103° F.; respiration, 55 to 60; pulse uncountable at the wrist, being extremely feeble, irregular, unequal, and frequent. His cough was almost incessant, and brought up a very copious amount of currant-jelly-like sputum, lacking, however, the tenacious appearance of ordinary pneumonic sputum: it was very free and liquid. He was breathing noisily and with great difficulty. Coarse and fine moist râles were heard all over the chest, quite masking the heart-sounds. There was no tubal breathing. Percussion was dull but not flat over both lower lobes posteriorly. There was no albuminuria. A hypodermic injection of $\frac{1}{4}$ grain of morphine with $\frac{1}{150}$ grain of atropine sulphate was given at once, and 12 drops of tincture of digitalis were given every third hour. A milk diet. 12th, easier; sputa still copious and deeply stained; orthopnœa; respiration, 48; temperature, 101° F.; cardiac pulsations, 120 to 140, very irregular, intermittent, and unequal, many pulsations not perceptible at the wrist; apex-beat felt in fifth intercostal space, two and a half inches to the left of left nipple; very little hearing impulse; cardiac dulness (relative) extends at level of the fourth rib, from the right border of the sternum, eleven centimetres; in fourth intercostal space, from one centimetre to right of right sternal border; towards the left, sixteen centimetres. Heart-sounds heard with difficulty, but a systolic murmur, not loud, but of a rasping character, was detected. There was no albuminuria; no anasarca. During the 13th, 14th, and 15th there was no decided change; cough, dyspnœa, cyanosis very pronounced, and surface bathed in cold sweat; no nausea. Continued digitalis. Complained of intense pain in right inframammary region and hypochondrium; border of liver dulness two finger-breadths below costal margin; this region was quite tender to pressure. 16th, chest clearer; sputa losing color, but general condition very bad; some delirium; cyanosis increased; extremities cold; surface bathed in sweat; slight albuminuria; some œdema of ankles; expression very bad. Eight ounces of blood were drawn by cups from the right hypochondrium. This was followed

by immediate relief of pain and much easier respiration (42). Pulse slightly stronger, but systole still most incomplete. During this day took 8 drops of tincture of strophanthus every fourth hour, but his condition grew so rapidly worse that it was abandoned. When the cupping was done, death seemed imminent. Pulse almost imperceptible at the wrist; deep cyanosis; urgent dyspnœa; cold sweats; slight albuminuria. 17th, some general improvement in the morning, but symptoms all became aggravated during the day, and at 10 P.M. was in extreme distress. Pulse at the wrist 96, while at the præcordium 120 very unequal pulsations could be heard. Eight ounces of blood were rapidly drawn from the right arm. While the blood was flowing the patient expressed decided feelings of relief, and the radial pulse became at once stronger and more regular. He presently fell into a quiet sleep, in a semi-recumbent position. His complexion cleared, his surface became warm and dry, and the most comfortable night he had had followed. On the 21st the cyanosis had disappeared, as had also the albuminuria. He took nourishment well and gave every evidence of improvement. Respiration, 36; temperature, 100° F. Improvement was steady, and in two months he resumed business. The mitral murmur and cardiac irregularity persist, but there has been no return of the grave symptoms. At the moment of venesection the symptoms gave both Professor Tiffany and myself the impression of impending dissolution, but from that moment amelioration was as apparent to the patient and his attendants as it was to us.

ON THE TREATMENT OF CHLOROSIS.

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WHEN pressed, it is with some difficulty that we are able to give a scientific definition of the term chlorosis. It is not especially difficult to say that there is a clinical entity which is called chlorosis; that this occurs especially in females at a certain age, accompanied by certain constitutional symptoms and others that are local. But after this is said, concisely or otherwise, it will be seen that, after all, there is lacking precision and definiteness, so that the predominant symptom of oligochromæmia, common to all cases of chlorosis, has been looked upon as settling the definition. Unfortunately, it is found that oligochromæmia is by no means characteristic of chlorosis, that it is found in all the anæmias, except the progressive pernicious form, and that, therefore, this one symptom cannot be looked upon as distinctive. We might add, that in health there may be temporary oligochromæmia, that the quantity of hæmoglobin varies very much as between healthy individuals and as between various times of the day in the same individual, and that oligochromæmia may be purely symptomatic of other conditions besides chlorosis.

In chlorosis the number of red corpuscles is not diminished; the reduction of hæmoglobin can be explained in two ways only, either as the result of deficient production, (hæmopoiesis), or increased destruction (hæmolysis). In an article on "The Intestinal Origin of Chlorosis" (*American Journal of the Medical Sciences*, July, 1893) I have shown that the blood process in chlorosis is that of faulty hæmopoiesis, and that this is proved by the deficiency of the end products of hæmoglobin destruction in the urine of chlorotic patients. This seems perfectly natural, in that, so far as we know, the destruction of red corpuscles and of hæmoglobin goes hand in hand, so that a destructive hæmolytic process could hardly exist which could destroy the red corpuscle without destroying the hæmoglobin. We can now extend our definition by adding that chlorosis is a blood disease, characterized by certain symptoms and due to faulty hæmopoiesis, so far as hæmoglobin is concerned. The faulty hæmopoiesis can be determined only by exact examination, first, of the blood (number of red corpuscles and quantity of hæmoglobin), and, secondly, of the urine, in determining the absence of urobilin (Gerhardt's test or the spectroscope). With Gerhardt's test in well-marked cases of chlorosis, the absence of reaction is sufficiently well marked to make the evidence very valuable. In patients in whom the percentage of hæmoglobin exceeds sixty per cent. (Fleischl), repeated examinations will have to be made, as I have found that, at times, the urobilin seems even to be increased. But even among these patients specimens are found in which urobilin is very much diminished. The importance of this diagnostic point cannot be too strongly insisted upon.

After this it becomes necessary, if possible, to detect the cause of this peculiar trouble, consisting, as it does, in lack of hæmoglobin formation, without cellular deficiency, or at least only such as will be explained as a secondary manifestation. As the result of a great number of observations (*loc. cit.*) it was found

that hæmoglobin is formed in large quantities in the intestine, both in man and some of the lower animals. For the present, it is not necessary to discuss the question whether it is formed in other places or not; it is sufficient to show that if the intestinal source of hæmoglobin were shut off either partially or wholly, there would be produced a condition of oligochromæmia. This assumption, I think, will be warranted by the figures.

In addition to this experimental evidence, I have found a toxic body in the urine of chlorotics, the exact nature of which it has been impossible as yet to determine, but one which, at present, justifies me in believing that it has its origin in the intestinal tract. Furthermore, that this body is the result of some perverse process, either bacillary or digestive, preventing the construction of the exceedingly complex hæmoglobin molecule. The other explanation that could be offered for its presence is that it is due to the splitting up of the albumin portion of the precursors of hæmoglobin which, under normal conditions, would have gone to the formation of hæmoglobin. However this may be, this toxic and probably compound body is found with certainty in cases of chlorosis in which the hæmoglobin falls below sixty per cent. (Fleischl), together with that form of urine in which the so-called urophæin test is absent, and in which it is impossible to find appreciable quantities of urobilin.

The fact must be insisted upon, then, that oligochromæmia is no more characteristic of chlorosis than glycosuria is of diabetes mellitus, or a membrane upon the throat is of diphtheria. The oligochromæmia must be of the kind described before, and must be accompanied by certain metabolic phenomena which are shown in the urine, and, secondarily, by the symptoms of the disease. As would be expected from the foregoing, it will be extremely difficult to find any characteristic evidences of chlorosis by ordinary examination. As a result, we find much confusion in terminology and great diversity in diagnosis. Where one physician will pronounce a case chlorosis, another will call it chloro-anæmia, a third simple anæmia, and my experience is that in many cases the true nature of the illness is not discovered at all, but the patient treated for hysteria or neurasthenia, and put through the ordinary routine treatments for these ailments.

In chlorosis we have two factors which produce all the symptoms,—the deficiency of hæmoglobin, and the presence within the blood of a toxic albuminous body. Up to the present it is impossible to state with exactitude the *rôle* played by one or the other, but it seems not unlikely that the individuality of the patient largely determines the predominant character of the symptoms. Thus, in a patient of hereditary neurotic tendency it takes very little to produce the symptoms of a neurosis, and the irritation of a toxic body as we find it in chlorosis (toxic only in large quantities) is sufficient to set up an irritation followed by any or all of the nervous phenomena in chlorotics. I am fully persuaded that, in a great number of so-called neurasthenics or hysterics, careful, frequently-repeated blood examinations will show this to be the etiology. It would not be difficult to go a step farther and claim that, as individuals differ, a moderate amount of chlorosis may be accompanied by very severe symptoms, especially on the part of the nervous system, on account of the presence of the toxic body, knowing, as we do, that the quantity of hæmoglobin can be reduced appreciably without being followed by manifestations.

In those cases in the adult in which the hæmoglobin is very much reduced—and I have put it at sixty per cent. or below (Fleischl)—there is present a train of symptoms due especially to faulty metabolism. The figure sixty per cent. has been taken because, in my experience in these cases, we have all the pronounced symptoms of chlorosis, while many individuals will have a reduction in hæmoglobin to nearly or about this percentage without causing the physician to suspect that so great a reduction exists. This is only an additional confirmation of the frequently-repeated statement of the importance and value of careful blood examinations.

This faulty metabolism is due to oxygen famine of the cells, concerning which we used to hear more than we do at the present day. It is but necessary to recall the fact of the importance of oxygen as a food, and that hæmoglobin is the body which carries it to the cells, to have placed before us the wide-spread and intense changes that may follow a lack of supply of this food. An appreciable reduction of hæmoglobin is always followed by a reduction in the respiratory function of the individual cells in the body; this, in its turn, affecting all the other functions. On account of the fact that the respiratory function is the most vital, it will be seen how even that function of the cell which, in a certain sense, is more important is bound to suffer. From this stand-point it will be easy to explain many of the symptoms of chlorosis without taking into consideration the toxic body at all; the functions of secretion, excretion, generation, irritability,

automatism, and general metabolism must, therefore, all become affected. Depending upon the individual, one or more of these are especially marked for suffering, and therefore the individual differences in the symptoms of chlorosis, the one complaining especially of gastro-intestinal symptoms, the other of symptoms on the part of the nervous system, the third of trouble in the generative tract, the fourth of a combination of one or more, and so on. It is a mistake to suppose that these symptoms are characteristic of chlorosis; anything producing a decided diminution in oxygen supply will produce them; increased hæmolysis, diminished oxygenation from mechanical or circulatory causes, or even general cellular starvation in which the cells have lost their ability to take up oxygen in sufficient quantity.

With this cursory statement concerning the causation of chlorosis necessary to the conception of treatment, we now turn to the latter itself. The remedies to be discussed are iron preparations, arsenic, blood preparations, and intestinal antiseptics. Without going into the various theories concerning the action of iron, it will be freely admitted that in a great many cases inorganic iron does increase the quantity of hæmoglobin in the blood. It matters very little how this is done, whether by absorption, by irritation of the intestinal tract, by prevention of formation of products of digestion (H_2S), or otherwise. The fact remains that in a certain number of cases of chlorosis—it would not be far out of the way to say in the greater number of cases—inorganic iron given per os does cure the disease. This can be determined by any one who will take the trouble to investigate the blood condition of chlorotics under this treatment. The researches of Kobert and his followers simply go to show that they have not found iron increased in the urine in those who have been taking iron by the mouth: the deductions drawn from these experiments are, apparently, perfectly logical. But when we come to consider that one milligramme is the quantity of iron usually excreted by a human being through the urine in twenty-four hours, and that this is by no means an invariable quantity in health, it will be seen that we are dealing with figures entirely too small to settle so important a question as iron absorption definitively. Furthermore, it must not be forgotten that all the iron taken up is not excreted, but in all probability large quantities are stored up in the liver for future use. Then there are other methods of elimination of iron (by the bile, the mucous membrane of the intestine) which altogether elude experimental research, so that all experiments up to the present must be considered inconclusive. The clinical fact remains as a last appeal for demonstration to the proposition that inorganic iron given by the mouth increases hæmoglobin. But how is this done? It can be safely admitted that inorganic iron must be converted into an organic combination in order to form hæmoglobin. That this is largely done in the intestine I have shown in the paper referred to before. But, in view of some therapeutic evidences, I should hesitate to say that this is the only place in the body in which this conversion can take place. Numerous authors, German, French, English, and American, have shown that hypodermic use of iron is followed by increase in hæmoglobin; iron injected into the peritoneal cavity (Vachetta) or iron given by the rectum (Chalhoub) does the same. From this it would seem that the red corpuscle itself, or other cells in the body, have the property of forming hæmoglobin when iron is brought to them in the proper form. What this form must be it is difficult to prove, but all existing evidences seem to show that the inorganic iron must first be converted into organic iron before it can be utilized by the economy; certainly this is the regular way in which food iron is brought to the economy. The perfect foods (milk and eggs) contain appreciable quantities of organic iron, and the iron equilibrium of the body is readily maintained without requiring any free iron in addition, differing largely from the water or common salt equilibrium.

Having admitted that in the larger number of cases of chlorosis iron does cure, there remains the minority in which iron seems to be utterly without effect. Enthusiastic as authors are in iron therapy, it is admitted on all hands that there are cases of chlorosis which do resist this treatment. Again, according to individual experience, some are tempted to place the value of iron very high, others very low; at all events, the fact remains that all cases of chlorosis cannot be cured by iron; so that it is not the iron supply that is deficient, but the iron utilization that is at fault, since many times the amount of iron required by the whole blood quantity has been given daily. It seems, then, that besides giving iron in the food, when this remedy is given internally, it must act in another manner than by its simple presence. The form in which iron is given has, of late, been the subject of great discussion; the parties are divided into two camps, the one claiming that it is necessary to give iron in organic combination in order to get the best effects, the other that this is not material. The former is

the most recent view, resulting from laboratory experiments, and especially those of Bunge and Kobert. Bunge isolated an organic iron compound from the yolks of eggs, and Socin found that in dogs it was absorbed, so that the quantity of iron excreted was increased. Control experiments made by Busch in Kobert's laboratory at Dorpat failed to verify this statement (those interested will find the whole subject thoroughly discussed in *Arbeiten des Pharmakologischen Institutes zu Dorpat*, Herausgegeben von Professor Dr. R. Kobert, vii., Stuttgart, 1891). From my own clinical experience, as well as from that of some of my friends, I do not hesitate to confirm the results of Busch, in that I have found hæmatogen without value in the treatment of chlorosis.

As a result of investigation, Kobert comes to the conclusion that certain reduction products of hæmoglobin will give better results than hæmoglobin itself, and he has, therefore, given to the world, through E. Merck, in Darmstadt, two bodies which he calls hæmol and hæmogallol, the former a zinc, the latter a pyrogallol derivative of hæmoglobin. Either one of these gives good results in the treatment of chlorosis, but, unless some other reasons than those advanced are given, they cannot be pronounced preferable to hæmoglobin itself. Indeed, in the method of treatment to be discussed, beef-juice, blood itself, or blood conserves do just as well as anything else. The most desirable of these preparations is that one which can be taken by the patient most readily for a long time. The new preparations are especially available, in that they can be given either in wafers or, as Kobert states, in chocolate tablets, the latter form being especially valuable for children. It would be useless to speak of the inorganic iron preparations at great length; there is no doubt that some act better than others (Blaud's pills); but it seems to me that such should be chosen as irritate the stomach least, are non-poisonous, and at the same time, when forced from their acid combination, will give rise to a substance which has a tendency to counteract the cause of chlorosis. Stockman (*British Medical Journal*, 1893), in a most interesting paper on "The Treatment of Chlorosis with Iron and some other Drugs," has given ferrous sulphide in keratin capsules for the purpose of effectually disposing of Bunge's theory of sulphuretted hydrogen by iron absorption. Only two cases were treated in this manner, but in these the results were so gratifying that they seem to verify the view taken by me, and certainly encourage further trial in this direction.

Arsenic can be looked upon as a valuable agent in the treatment of chlorosis. Doubtless, any number of cases of chlorosis could be collected that have resisted iron and have been relieved by arsenic. It seems more than improbable that it should take the place of iron in the hæmoglobin molecule; indeed, no such combination is known to exist; so that when it acts the effect upon hæmoglobin is an indirect one. The physiological effects of arsenic are so many—tending to improve digestion, the general nutrition, and its beneficial action upon the nervous system so forcibly insisted upon by Gubler—that, with the general rise in metabolism, hæmoglobin must, as is shown by clinical experience, be increased. In its effects upon hæmoglobin formation, I would lay especial stress upon its action upon digestion, notably upon the digestion in the small intestine; the anæmia of children, in whom we find such enormous variations in the quantities of hæmoglobin following intestinal troubles, is most effectually removed by arsenic preparations. Experiments which I have made with arsenite of copper have led me to believe that this combination is very valuable in such cases and also in adults, where, as is sometimes the case, the bowels are loose and the intestinal catarrh can be looked to for the cause of hæmoglobin diminution.

We now approach the last remedy to be discussed,—the intestinal antiseptics. From a theoretical stand-point, intestinal asepsis is an impossibility, due to many reasons,—the structure of the alimentary canal, the kinds and number of the micro-organisms found there, the nature of the food, and, more important still, the fact that air is constantly being introduced into the stomach and, naturally, into the small intestine. It was, therefore, not a matter of surprise to me to find one of my patients, whose stools had been made almost odorless by the internal administration of large doses of hydronaphthol and whose hæmoglobin was steadily advancing, develop a well-marked case of typhoid fever. But because great expectations have been entertained and not fulfilled is no reason why partial intestinal antisepsis cannot be accomplished. The bacteria of putridity really seem to be affected by some of these remedies; I am now referring to the results of clinical investigation, not of test-tube experiments, in which so many things have succeeded that have failed us in practice. Starting, then, with the idea that in chlorosis hæmoglobin formation was prevented either by abnormal putridity or hydrolytic action in the small intestine, perverse in its nature, it seemed

natural to select a number of cases of chlorosis for treatment, to see whether the quantity of hæmoglobin could be increased without the use of iron. I have used, experimentally, many antiseptics,—creosote, hydronaphthol, salol, arsenic preparations, bismuth, and tannic-acid combinations,—and have finally settled down to the routine use of the four former remedies. In the paper referred to above I state (*loc. cit.*) that hæmoglobin can be increased in every individual on whom I have tried it (eleven cases) by the administration of either salol or hydronaphthol, the latter being, upon the whole, more efficacious in that the rise in hæmoglobin was more rapid. Since writing this paper I have combined intestinal antisepsis with administration of iron-containing substances, and the results can be stated as follows: The best possible results controlled by blood analyses as to time, quantity, and permanency, are obtained by combining an antiseptic with a blood preparation. I give 5 grains hydronaphthol or salol before meals and the same quantity of hæmogallol immediately after the meal. When these preparations cannot be obtained, large quantities of beef-juice can be substituted, or any of the many preparations which contain blood; precaution must be taken to see that they really do contain blood in case the latter are used. In children I have given up the use of salol for this purpose, and in adults it is used with great caution; in the former it has produced mild carbolic-acid poisoning, and the latter have shown, in several instances, evidences of carbolic acid in the urine. Whether or not salacetol will be a perfect substitute for salol remains to be seen.

Second in utility comes the administration of the antiseptic before the meal and some form of iron after the meal; carbonate of iron has given better results than any other preparation I have used.

It is difficult to decide as to the relative merits of iron or antiseptics when given separately; it is certain, however, that the antiseptics will succeed when given alone in many cases in which iron fails completely. But this does not invalidate the previous statement that in the great majority of cases iron used alone succeeds in giving relief, though not as promptly as the antiseptics. I have purposely refrained from mentioning sulphur, as my own investigations were begun before its introduction as a method of treatment in chlorosis. It is not going too far, however, to state that its employment with success seems to further strengthen the views that have been stated above concerning the etiology of chlorosis.

In conclusion, I have appended the report of several cases treated with the various combinations mentioned before.

			Remarks.
Miss A., aged 19; red corpuscles 4,225,000	HC. 60.*	Salol.	Menstrual difficulties; constipation; menstruation,* steady increase in HC.
First week	HC. 70.		
Second week	HC. 75.		
Third week	HC. 85.		
Fourth week	HC. 90.*		
Fifth week	HC. 95.		
Miss S., aged 20; red corpuscles 3,766,000	HC. 40.	Hydro-naphthol.	Menstruation* always regular; attacked with typhoid fever, from which she recovered.
First week	HC. 50.		
Second week	HC. 45.*		
Third week	HC. 55.		
Fourth week	HC. 65.		
Fifth week	HC. 70.		
Miss B., aged 24; red corpuscles normal	HC. 75.	Hydro-naphthol and blood preparation.	Menstruates irregularly, sometimes every three weeks; menstruated.* Obstinate case; has been taking tonics (ferruginous) for years; has been well ever since discharged.
December 29, 1892	HC. 75.		
January 4, 1893	HC. 80.		
January 26, 1893	HC. 75.*		
February 14, 1893	HC. 85.		
February 22, 1893	HC. 95.		
Mrs. E., aged 30; red corpuscles normal	HC. 60.	Hydro-naphthol and hæmogallol.	Hysteric; has been treated by rest-cure, etc.; has taken large quantities of iron; has had several operations upon genito-urinary organs. Recovered completely, but has had to be put upon treatment once since her first discharge, with the same beneficial result as before.
November 28, 1892	HC. 60.		
December 17, 1892	HC. 70.		
January 7, 1893	HC. 75.		
January 18, 1893	HC. 85.		
February 13, 1893	HC. 95.		
February 27, 1893	HC. between 95 and 100.		

THE USE OF NITRO-GLYCERIN IN ARTERIO-SCLEROSIS.

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BUT little more than twenty years have elapsed since arterio-sclerosis was first demonstrated to be a distinct and definite disease, and, as is well known, it is to Gull and Sutton we are indebted for this addition to our medical knowledge.

It is necessary for us to fully understand the nature of arterio-sclerosis in order that we may clearly appreciate the reasons advanced for the employment of nitro-glycerin in its treatment. Equally important, also, is it for us to have a clear idea of the drug's physiological actions.

The most commonly accepted theory explaining the manner of the development of arterio-sclerosis is that advanced by Thoma in a number of articles published in *Virchow's Archives*. Thoma finds the development of the disease to depend upon a series of conditions which conform to the following law, viz.:

A slowing of the blood-current in an artery that is not at once and completely counteracted by a proportionate contraction of the media leads to a new growth of connective tissue in the intima, which lessens the lumen of the affected vessel and thus restores the normal swiftness of the blood-current more or less completely.

According to this law, therefore, the lesion has its origin in the media, which, in some way not known, has lost its tone. As a result of this impairment of the elasticity of the media the artery dilates, and, as a consequence, the normal swiftness of the blood-stream is lessened. The slowing of the blood-current produces, in turn, a hyperæmia of the vasa vasorum and a new growth of connective tissue in the intima, with which there is subsequently associated a similar formation in the media and adventitia. So soon as the growth of new tissue reaches such dimensions in any situation that the normal swiftness of the blood-current is thereby re-established, the sensitive nerves are restored to their normal condition, the hyperæmia of the vasa vasorum disappears, and no new tissue forms in the intima until the blood-current again undergoes changes of speed and again makes operative the various factors originally involved in the production of the disease.

Now, let us see how these changes in the arterial walls will affect the various tissues and organs the nutrition of which it is the function of the blood-vessels to provide for. As this degeneration is characterized by a more or less distinct swelling, the compensatory thickening of the intima projects to some extent into the lumen of the vessel and thus interferes with the blood-current. In the same manner is the orifice of the blood-vessel narrowed at its point of branching off from the parent vessel. "Various and grave disturbances of nutrition may, of course, result in the organs to which these branches go, and it is conceivable that often thus a vicious circle is established. Thus, the diseased arteries supply less blood to a given organ than its proper nutrition requires, and local degenerations ensue in the organ. These changed conditions call for still less blood, and there results a further disturbance in the rapidity of the current in the affected artery. This causes further changes in the vessel's intima" (Peabody).

Thus we will find that the same vicious circle that becomes established in the various organs of the body involves with them the arteries themselves. The vasa vasorum, sharing in the general sclerotic change, supply less blood to the arteries than is required for their proper nutrition; further degeneration of the arterial walls follows, calling for less blood for nutritive purposes, which produces, in turn, a slowing of the blood-current in the vessels supplying the arteries; consequently the intima of these vessels becomes the seat of further degenerative changes.

We have found, therefore, that we are dealing with a disease one marked feature of which is a mechanical interference with the blood-current, due to progressive narrowing of the lumen of the blood-vessels, and that a necessary result of this obstruction is a lessening of the supply of blood essential to the nutrition of the tissues, resulting in various tissue degenerations.

Let us see now what are the properties of the drug with which we propose, if not to permanently arrest the progress of the disease, at least to ameliorate its most striking and annoying symptoms.

When a dose of nitro-glycerin large enough to produce the physiological effects is taken, there follow more or less flushing of the face and a feeling of fulness of the head which, in some individuals, is accompanied by dizziness. These manifestations are the result of a dilatation of the superficial vessels, which, according to Brunton, is due to weakening or paralysis either of the muscular walls of the arterioles themselves or of the vaso-motor ganglia in or near them. That the effects of the drug are not due to its action upon the sympathetic acting upon the muscular structure of the arteries

through the vaso-motor centre, he demonstrates by showing that the nitrites lower the blood-pressure in animals even after the cord has been divided just below the medulla.

Nitro-glycerin, therefore, lowers blood-pressure by producing a dilatation of the arterioles, and it is upon this dilatation of the arterioles that the value of the drug in the treatment of arterio-sclerosis depends. We found that in arterio-sclerosis, because the tissues receive too little blood for their proper nutrition, local degenerations occur, and that these local degenerations, disturbing again the equilibrium of the circulation, cause still further sclerotic changes to occur in the arterial walls. By causing a dilatation of the blood-vessels, and thereby supplying the tissues with a larger amount of blood for their nutrition, not only will the progress of degenerations in the various organs and tissues be retarded, but the course of the disease will also be arrested in the arteries themselves by supplying them, in the same manner, with a larger quantity of blood.

The most important clinical manifestations of arterio-sclerosis are directly due to the condition of the blood-vessels which interferes with the blood-supply to various organs.

The following cases, briefly cited, will give a clear idea of the chief of these symptoms and to what extent nitro-glycerin may be relied upon for their relief.

Case I.—J. McL., aged twenty-eight; a lumber salesman. Family history negative. Patient for past ten years, in following his occupation, has had a very exposed life, and in addition has been subjected to arduous railroad travelling which, in the course of a year, covered many thousands of miles.

The symptoms mostly complained of were vertigo, headache, and palpitation of the heart. The examination of the heart showed no enlargement of that organ; the first sound, however, was louder and longer than normal, and the second sound was markedly accentuated. The radial at the wrist showed decidedly thickened walls. Arterial tension was increased.

Urinalysis showed albumin to be present in small quantities. The average amount of urine passed in twenty-four hours was seventy ounces. The microscope revealed hyaline casts.

Nitro-glycerin was administered, and pushed until physiological effects were produced. Its effect upon the headache, vertigo, and palpitation was almost immediate, and in three months the albumin and casts had entirely disappeared from the urine. The drug was then suspended. In two months, however, the patient returned with the original symptoms present and albumin and casts again in the urine. Nitro-glycerin was again administered with the same results as upon its previous exhibition. With occasional intermissions, the patient was kept upon nitro-glycerin for the period of one year. It is now over a year since treatment was suspended, and there has been no reappearance of the albuminuria or other symptoms.

Case II.—P. C., aged forty-five; a tailor. Family history not obtainable. Patient in appearance a man of fully sixty-five years of age. For many years had habitually used alcohol to excess. Complained of headache, intense vertigo, causing him at times to fall in the street, and impairment of memory. An eye examination showed some recent and many old retinal hemorrhages. Urinalysis revealed albumin; quantity of urine voided in twenty-four hours increased; microscopically were found hyaline and some granular epithelial casts. The superficial vessels showed a marked degree of sclerotic change, and arterial tension was greatly increased. The heart was considerably hypertrophied; first sound prolonged and booming in character, and second sound markedly accentuated.

The patient was first put upon treatment over three years ago, nitro-glycerin being the remedy selected. While no curative result has been obtained, yet the drug accomplished an undoubted retardation in the progress of the disease, in addition to the almost complete disappearance of the cerebral symptoms, including a marked improvement in the memory.

The above cases, selected from a number that have been under observation, will suffice to illustrate the uses of nitro-glycerin in arterio-sclerosis.

As previously stated, the chief symptoms of arterio-sclerosis are due to the malnutrition of various organs resulting from a lessened blood-supply; nitro-glycerin relieves these symptoms by increasing the blood-supply of any given tissue. The cardiac hypertrophy, however, so common an attendant upon this disease, is caused by increased peripheral resistance. By lowering the blood-pressure and, according to Bartholow, by removing the inhibition exercised by the pneumogastric nerve, thereby lessening the work of the heart, nitro-glycerin results in relief of this condition. The advantages from the use of the drug in attacks of angina pectoris are too well known to require discussion.

Because nitro-glycerin lessens arterial tension and thereby diminishes the amount of urine voided and lessens the output of albumin, and

because it increases the blood-supply to the kidneys and therefore improves their nutrition and prevents further degenerative processes, is its exhibition advantageous in the renal changes accompanying arterio-sclerosis.

Nitro-glycerin is best administered in the form of a centesimal solution, or as tablet triturates, each containing $\frac{1}{100}$ grain of the pure drug.

Inasmuch as the susceptibility to the action of the drug varies very greatly, the dose cannot be stated in advance. It is therefore advisable to begin with a dose of $\frac{1}{100}$ grain, watching its effects, and increase it until the physiological actions of the drug become manifest. In some individuals small doses will continue to maintain the physiological effects of the drug, while in others, as in a case some time since reported by Dr. D. D. Stewart, of Philadelphia, a remarkable tolerance, even to massive doses, becomes established. According to my own experience, those cases respond best to the use of the drug in which small doses continue to maintain its physiological manifestations.

The effects produced by nitro-glycerin upon the pulse vary somewhat, though not materially, in duration in different individuals. In one of my cases the effects of a dose just sufficient to produce the physiological actions did not disappear from the sphygmographic tracing for nearly three-quarters of an hour. According to Murrell, however, whose observations upon the subject have been made with great accuracy and have come to be regarded as authoritative, the tracing resumes the normal in less than half an hour. As the effect of the drug is but transient, therefore, the interval between the doses should not exceed two or three hours.

Nitro-glycerin tends to arrest the oxygen-carrying function of the red blood-corpuscle, and it is therefore important not to give it in doses larger than necessary to produce the desired effects, and during long-continued courses of the drug to interpose frequent periods of abstinence from its use.

Arterio-sclerosis is a progressive disease, and it is not claimed, therefore, that nitro-glycerin will effect a permanent cure. It is claimed for the drug, however, that it will retard the progress of the affection and alleviate many of its most distressing and serious manifestations.

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ANTISEPSIS IN CATARACT EXTRACTION.

A Lecture delivered at the Philadelphia Polyclinic.

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In discussing with you this evening the measures best suited to the operation for the extraction of cataract in order to secure normal healing of the wound, we naturally turn to those which an ever-accumulating experience has demonstrated are most potent to destroy, or prevent the entrance of, septic organisms. It would be interesting, did time permit, to trace the gradual development of the present status of ocular antisepsis. How strange it would appear were an operator now to perform extraction under the carbolic spray, or cover his patient's face with the cumbrous dressings of the early antiseptic days! And yet not many years have elapsed since just this unwieldy paraphernalia would have been considered of the same paramount importance which we attach to the more dainty, and probably more effectual, methods of the present time.

Ophthalmic surgeons are ever ready to acknowledge the great debt which they owe to the splendid achievements of antiseptic general surgery, but it must be remembered that operations on the eye, as exemplified by the extraction of cataract, bear a peculiar relation to the sources of contamination. I cannot better illustrate this than by quoting a sentence written by Knapp in 1886: "The operations on the

eyeball are mostly small; the territory is so well protected that after the closure of the lids the conditions resemble pretty closely those of a pure subcutaneous operation; furthermore, the conjunctival sac is constantly bathed in an antiseptic fluid,—the tears; there is little occasion to contaminate the wound with hands, dressing materials, or instruments difficult to keep clean; the operations are soon over, and therefore exposed to injurious influences for a short time only—all this explains why the results obtained by careful operations without the use of antiseptic agents have not been inferior to the results of those that have imitated the antiseptic methods of general surgery." This sentence is inserted, not to cast doubt upon the value of antiseptic surgery, but simply to show that while we strive to appropriate everything from its advanced methods applicable to the field of operation in the extraction of cataract, the ophthalmic surgeon must not be content to trust to antiseptics alone for good results. To quote again from Knapp: "The therapeutic problem is: To operate in such a way that no mortification by bruising occur, and where this cannot be avoided, to take such measures as to prevent the putrefaction of the bruised part—antiseptic treatment." Therefore, when we combine correct technique and proper asepsis, we are in the best position to secure the most favorable results.

It is the purpose of the present lecture to describe various measures which are at present pursued in order to secure this proper asepsis, taking for granted that in every operation the manipulations are in accordance with those principles and practices which abundant experience has proved, from a mechanical standpoint, to be essential. You well know that the character of the tissues involved in many eye operations precludes the propriety of employing powerful germicides in the manner in which they may be used by general surgeons, but all the principles of clean surgery, and the main practices of antiseptic surgery properly modified to suit existing circumstances, are applicable and necessary in ophthalmic operations.

Preparation of the Hands of the Operator and Assistants.—This, when it relates to general surgery, and particularly that form of surgery which deals with the abdominal viscera, is of the utmost importance. The tendency at the present time, in dealing with wounds belonging to this class of operative work, is not, as was once the case, to flood them freely with strong germicidal solutions, which of themselves are dangerous to the patient's general condition, and probably detrimental to the rapid healing of wounds, but to see that no septic organism or cause for mortification is introduced into the area of operation by the hands of the surgeon. Hence a large amount of experimental work has been performed in order to find the best method for rendering sterile, as nearly as possible, the hand of the operator, which is bound to come in contact with the tissues themselves. Fortunately, while the ophthalmic surgeon will use due caution that his hands are clean, they do not in the operation which we are discussing come in contact with the operative wound. Therefore he may select one of several well-recognized methods. The following is satisfactory: Scrub the hands thoroughly with soap and water; then clean the spaces beneath and around the nails; soak the hands in ninety-five-per-cent. alcohol for not less than one minute; on removing them, place them without drying in a solution of 1 to 1000 corrosive sublimate, and allow them to remain there for at least one minute.*

Preparation of the Skin in the Region of Operation.—Again, we need not review the comparative value of the methods in this direction with the same nicety that would be required were we discussing an operation in general surgery. The object is to have the surrounding skin clean, but, as it is not brought in contact with the wound, nor incised during the operation, the same apprehension that obtains in the first instance does not pertain to the operation of extracting cataract. The following method is perfectly safe: The skin should be treated first with soap and water, then with alcohol, and finally with corrosive sublimate, 1 to 2000. These irritating substances must not enter the conjunctival sac, but the face, surface of the closed lids, eyebrows, brow, and scalp should be thus prepared. The parts should be kept covered for several hours before the operation with squares of gauze soaked in a bichloride solution (1 to 5000).

Preparation of the Conjunctival Cul-de-sac and Area of Operation.—This portion of the preparatory treatment presents the greatest difficulties. Even if it were possible, under any circumstances, to secure absolute sterilization of an area by means of powerful germicides, this would be impracticable in ophthalmic work, because the cornea and conjunctiva, or the parts to be disinfected, could not tolerate such solutions in sufficient strength. For example, Stroschein,† after referring to the

* Consult "The Aseptic Theory and its Practice," by J. William White, M.D., *University Medical Magazine*, vol. i. p. 206.

† *Graefe's Archiv*, xxxix., Part I., p. 256.

fact that bichloride of mercury is the most popular antiseptic under such circumstances in solutions of 1 to 5000 or 1 to 4000, and that, according to the experiments of Weeks, it destroys the staphylococcus pyogenes and streptococci in from two and one-half to three minutes, points out that contact of this drug with the cornea and conjunctiva for such a length of time must necessarily be detrimental to these structures, and, moreover, that the time required to destroy the cocci in mucous membrane is considerably greater than in the test-tube of a laboratory.

Again, Bernheim,* experimenting with various methods of ocular antisepsis (not only bichloride of mercury) on the basis of numerous culture experiments, has demonstrated that we have no means of entirely freeing the conjunctiva from the micro-organisms to be found there, even in its normal condition, although with proper methods of disinfection their number may be reduced and the vitality of those which remain weakened for several hours.

Touching the point of the micrococci which are present in the normal conjunctiva, it should be remembered that they exist in great numbers, and that for various reasons they are not always non-pathogenic. My friend, Dr. Joseph McFarland, who has worked much in this field, writes me that he has found ten varieties of various micro-organisms and from six to ten of micrococci; and among the latter, staphylococcus pyogenes, both aureus and albus, is not a stranger to the normal eye. He has also discovered a micro-organism closely corresponding to Dr. Welsh's staphylococcus epidermidis albus, which is thought to be an attenuated form of the staphylococcus pyogenes albus. As Dr. McFarland points out, the variety of micro-organisms found in the eye varies with the environment of the individual. There is probably no organism normal to the eye, because those found simply represent such as have accidentally obtained a resting spot in the folds of the conjunctiva. Therefore, in the normal conjunctiva we deal with micro-organisms more or less constantly present, both pathogenic and non-pathogenic, with others that readily find access to it from the neighboring naso-pharynx, and finally with those which are freely present on the margins of the lid, a position in which they are always in greater excess than in the conjunctival sac itself, and from which they readily migrate to the conjunctiva and become a source of infection.

We know that we cannot perfectly sterilize either the palpebral edges or the conjunctival cul-de-sac for the reasons already stated. The object is to reduce the vitality of the microbes that cannot be washed away, and the mechanical effect of the fluids used is perhaps quite as potent as any possible germicidal value which they can exercise. Hence there is no object in using a strong germicidal solution, or one that is likely to be deleterious to the delicate epithelium of the corneal surface. It has been abundantly proved that excellent results accrue after the irrigation of the cul-de-sac with so mild a drug as boric acid, which, as you know, is scarcely antiseptic at all, and consequently it is not improbable that the same effect would follow the use of a sterile physiological salt solution.

Therefore, for irrigating purposes we may employ, provided the fluid reaches all portions of the conjunctival cul-de-sac and thoroughly scours out the folds of the conjunctiva, boric acid, four per cent.; or physiological salt solution, which may be prepared by adding a heaping teaspoonful of salt to a pint of water sterilized by boiling. If an antiseptic fluid is preferred, one of the following: bichloride of mercury, never stronger than 1 to 5000, and preferably 1 to 10,000, because, as has been demonstrated, its germicidal value is doubtful and in strong solution its deleterious action is certain; cyanuret of mercury, particularly advocated by Chibret,† in a strength of 1 to 1500 added to 1 to 7000 of sodium chloride; or trichloride of iodine, recommended by Pflueger‡ in a solution of 1 to 5000. Many other antiseptics might be mentioned in this list,—for example, biniodide of mercury, advocated by Panas and by Fenton, of this city; aqua chlorinata, which has been much praised by Schmidt-Rimpler in various ocular inflammations; weak solutions of carbolic acid; and the recently-described formic aldehyde, declared by Valude § to be non-irritating in solutions of 1 to 2000, and which is supposed to have particular value in disinfecting conjunctivas because its effect is lasting, more so than that of bichloride. In cases of patients destined for operation, Valude has performed disinfection with sublimate (1 to 2000) on one of the eyes, and on the other with formic aldehyde in the same dose. The conjunctivas washed with aldehyde were sterile fourteen times out of sixteen, while with sublimate the

* Thèse de Zurich, 1893. Abstract in *Annales d' Oculistique*, July, 1893.

† *Recueil d' Ophthalmologie*, August, 1893, p. 507.

‡ *Ibid.*, May, 1892.

§ *Revue Générale d' Ophthalmologie*, July, 1893.

same fact was noted in only half the cases. We should wait for confirmatory evidence, however, both clinical and experimental, before endorsing the drug.

It is impossible to completely sterilize the cilia. This has been proved by Bernheim, Stroschein, and numerous other experimenters, no matter whether the washing is done with a germicidal lotion or with a physiological salt solution. Hence, careful cleansing with soap and water, followed by the salt solution or one of the antiseptics mentioned, accomplishes the only practical result,—namely, diminution of the vitality and the number of cocci.

Preparation of the Instruments.—I will not occupy your time with a discussion of the great variety of substances which have been used for the purpose of sterilizing instruments. The chief difficulty is that sharp instruments, particularly the cataract-knife, are readily dulled by long contact with any germicidal fluid. All sorts of ingenious devices are at hand, and all of the various fluids have from time to time received attention; but recent experiments, particularly those of Nuel* and Stroschein† demonstrate that boiling is perfectly satisfactory, especially if a two-per-cent. solution of carbonate of sodium is added to the water.

Boiling, however, is also likely to spoil the edges of sharp instruments. Hence, Stroschein believes that it is sufficient to rub them with cotton-wool soaked in a mixture of equal parts of alcohol and ether, and subsequently to wash them in a five-per-cent. solution of carbolic acid. In a series of experiments made with Graefe's and Beer's knives the instruments were infected with pus or cultivations of pyogenes aureus. They were then left to dry and subsequently disinfected by rubbing with wool soaked in a mixture of equal parts of alcohol and ether and a few drops of ammoniac. After this they received a fresh rubbing with another piece of wool soaked in a five-per-cent. carbolic-acid solution, the handle being similarly treated, and they were finally placed in a sterilized salt solution. This treatment secured asepsis in every case, except where the instrument-maker's name was stamped on the blade, the unevenness thus produced rendering perfect sterilization difficult.

When the instruments are removed from the boiling solution they may be placed in a bath of physiological sterile salt solution or, better, in absolute alcohol. Now, although alcohol is not an active germicide, it is a good preservative; indeed, in spite of the assertion of some excellent text-books, absolute alcohol is not without germicidal properties, except for spore-bearing bacilli. Sternberg has found that pus cocci were destroyed by forty-per-cent. alcohol in two hours, but ninety-five-per-cent. alcohol is without effect on broken-down beef-tea in forty-eight hours. Yersin demonstrated that absolute alcohol would kill tubercle-bacilli in pure culture in five minutes, and a large excess of absolute alcohol mixed in the sputum will kill these germs in twenty-four hours. In the experiments of Emil de Schweinitz, eighty-five- to ninety-five-per-cent. alcohol was sufficient to destroy the vitality of hog cholera and swine plague germs in cultures in twenty-four hours. Therefore we may with safety put the instruments in absolute alcohol and allow them to remain in the bath until ready for use. A fine knife, however, subjected to the action of absolute alcohol for a long time will lose its edge. Hence the bath should not exceed twenty minutes, and if this is too long the Stroschein method may be substituted.

Preparation of the Dressings.—I am in accord with the statement of Nuel that the impregnation of dressings with antiseptic substances is far from satisfactory, especially when such are bought ready-made from the various shops. Sterilization with steam is satisfactory. If a wet dressing is desired, the fabric may be soaked in one of the antiseptic fluids, usually bichloride (1 to 5000), or in a physiological salt solution which has been sterilized by boiling. Bits of gauze prepared by sterilization with steam are neater, cleaner, safer, and in every way more desirable than cotton for removing blood, etc., from the area of operation. No one is inclined to use sponges, which long since have been relegated to the background. If the lighter forms of cataract dressing are applied, such as isinglass plaster, or small wads of cotton held in place by strips of surgeon's silk isinglass plaster, these should be properly disinfected in the manner indicated before application.

Preparation of the Fluids used, and particularly the Alkaloidal Collyria.—The facility with which various fungi grow in many lotions commonly used in the treatment of ocular diseases, and particularly in solutions of alkaloids,—cocaine, atropine, and eserine,—renders it necessary to pay strict attention to the best methods of sterilization under these circumstances. A number of methods have been practised, which may be summarized as follows: Sterilization by heat, by the addition of an

* *Revue Générale d'Ophthalmologie*, May, 1893.
† *Loc. cit.*

antiseptic, by the combination of these two methods, and by the chemical synthesis of alkaloids with antiseptic acids. The last method is not satisfactory.

Taking cocaine as an example, it may be prepared by adding to it a 1 to 5000 solution of bichloride of mercury, or 1 to 1000 of oxycyanide of mercury, one-half per cent. of carbolic acid, four per cent. of boric acid, thymol in the form of thymol water, chloroform water, or formic aldehyde, as recommended by Valude. As Francke has shown, sublimate (1 to 10,000), oxycyanide of mercury (1 to 1000), and thymol water surpass others in their potency against the staphylococcus pyogenes flavus. The best method of all is to boil the solution, and then preserve it for use by adding a portion of sublimate (1 to 10,000), which renders it sufficiently aseptic for the space of one-half to one hour.

The bottles and pipettes should be sterilized by boiling and mechanical cleansing; an ingenious combination of flask and pipette has been devised by Stroschein.* This is a blown-glass bottle constructed with a dropper, which may be directly exposed to the flame, thus rapidly sterilizing the bottle and its contents. The pipette has two conical ends, and is introduced into the neck of the bottle point upward, the rubber head being removed before the reversal. If the collyria are to be boiled, the small tube gives vent to the steam, which, passing through it, at the same time sterilizes it.

A number of so-called antiseptic droppers have been devised, one well-known pattern consisting of a combination of the dropper and glass stopper in a single piece of glass. All these devices are ingenious, but they do not secure the introduction into the eye of an aseptic fluid, because, as has been proved over and over again, the water in which the drug is dissolved may not be clean, and the solutions of the alkaloids, even when freshly prepared, will usually yield a growth of fungi and various micrococci in culture media. In a series of experiments which I have made in conjunction with Dr. E. A. de Schweinitz, of Washington,† it was abundantly shown that unclean solutions which find their way into the anterior chamber —for example, after section of the cornea—are capable of speedily originating a destructive inflammation of the uveal tract, terminating in panophthalmitis. This is true of any alkaloidal solution, but especially of cocaine, and, moreover, we were able to show that boric acid itself, when not freshly prepared, may be the medium of the most virulent contamination.

Causes of Failure.—It is hardly necessary in this audience to enumerate the most important contraindications for cataract extraction, even in the presence of the most perfect antisepsis. No one would wish to extract a cataract if there were an active blepharitis, conjunctivitis, dacryocystitis, or aggravated naso-pharyngitis. It goes without saying that these must be removed or their virulence reduced to the lowest ebb before extraction is permissible.

But even in reasonably healthy eyes and ocular surroundings the contamination of the wound may take place by bringing the edge of the eyelid in contact with the corneal section. We know how impossible it is perfectly to free this margin from cocci and bacteria. Therefore, the practice of expelling the cataract by rubbing the cornea through the lid is to be deprecated.

Even in the absence of active lachrymal disease, no case should be operated upon without an exploration of the lachrymal points, lachrymal sac, and nasal duct, and the simple experiment of pressing over the region of the sac to see if there is any accumulated secretion will be the means of avoiding many an awkward experience.

Not enough attention, in my judgment, is paid to the naso-pharynx. If there is naso-pharyngeal irritation, treatment should be instituted, and I would advise the spraying out of these passages for a day or two before the extraction is undertaken, either with a mixture of listerine and Dobell's solution, or, on the recommendation of my colleague, Dr. Arthur Watson, with equal parts of water and peroxide of hydrogen, which flushes out these passages and probably, largely by mechanical effect, gets rid of infectious material. Independently of the fact that chronic bronchitis, by virtue of the cough which it produces, is a complicating circumstance, it is also perfectly possible that pathogenic germs may migrate from the lower respiratory tract and destroy the effects of an operation. I have in several cases administered, in addition to local treatment with sprays, etc., capsules of the oil of eucalyptus, which is certainly good as a stimulating expectorant, and possibly plays the part of a mild antiseptic.

Finally, I come to the cases of failure which result from a flaw in the detail of the antisepsis. These may be illustrated by reverting to an instance witnessed in an operating-amphi-

* *Archiv f. Ophthalmologie*, Bd. xxxviii., Abth. 2, p. 155.

† Transactions of the College of Physicians of Philadelphia, April, 1893.

theatre. The knife taken from the bath (carbolic acid) was handed to the operator by an assistant, who first wiped its blade with a towel that a moment before had been lying on the floor of the clinic-room. In another case an operator was about to make his section, when a colleague stepped into the room and was asked to assist. Thoughtlessly, he stepped to the patient's head and raised the carefully-sterilized lid with his uncleansed fingers. I need scarcely allude to the practice sometimes, though fortunately rarely, seen, of holding the knife, or rather the knife-handle, in the mouth. True, it is only the handle, but who would submit to the extraction of a cataract performed with a knife which had come so closely in contact with the mouth as such a procedure permits? These instances of thoughtlessness, carelessness, I was going to say malpractice, might be multiplied. It is unnecessary. Just as you attempt to make a perfect section, which, as has already been pointed out, is one of the two important therapeutic requisites in cataract extraction, so, also, you will not omit the smallest detail in the antiseptic procedures. Then if you are so unfortunate as to have a bad result, at least your conscience is clear, for you have done the best that modern science teaches.

Three points more and I have finished:

(1) Is there any test by which we may tell that an eye is ready for operation, provided there is any suspicious condition connected with it? Have the preparatory methods been sufficient? Nuel, discussing this point, lauds a practice which has been my own, and I am sure that of many surgeons in this city, for a long time,—namely, the application of a preparatory bandage. It is done in this wise: A day or two before the operation an ordinary double figure of 8 is applied to the eye over several squares of antiseptic lint laid next to the lids and held in place by a small quantity of cotton filling out the orbit. At the end of twenty-four hours the bandage is removed. If the eye is flushed, if the conjunctiva is watery, if the margin of the lid is slightly œdematous, and particularly if the gauze is stained with mucus or muco-pus, the eye is not ready for operation. This method has been elaborated by many surgeons; Haab, as you know, going so far as to close the lachrymal points by means of the actual cautery, thus shutting off the connection of the lachrymal apparatus with the conjunctiva. Other operators apply specially-devised dressings,—for example, Dimissas* suggests a dressing composed of a mixture of salol, boric acid, iodoform, and salicylate of bismuth. Upon this is applied antiseptic cotton dipped in a solution of sublimate (1 to 2000). The dressing must be removed in twenty-four hours. If the conjunctiva is dry and there is no vascular injection, a second dressing is applied, and the latter must not be removed until the moment of operation. If there is a secretion, then the dressing must be repeated each day until an entirely satisfactory condition is obtained. I believe, however, that the simpler method will answer an equally good purpose.

(2) While not belonging strictly to the subject of antisepsis in cataract extractions, I cannot refrain from referring for a moment to irrigation of the anterior chamber. It is now universally conceded that if this be done, the bichloride of mercury must never be used. It is well known that it is capable of originating permanent corneal opacities, and Mellinger† has shown that a solution of corrosive sublimate (1 to 10,000), if present for a short time in the anterior chamber, produces a parenchymatous opacity in the cornea, and if any of the solution remains in the anterior chamber a permanent opacity may result. Other fluids, as distilled water, weak acids, alcohol, and aqua chlorinata, produce opacities of varying degrees of density and permanence. On the other hand, a three-per-cent. solution of boric acid, or a half-per-cent. of sodium chloride, according to this experimenter, can be injected into the anterior chamber without bad results. Nuel, also, has shown that irrigation of the anterior chamber after cataract extraction with any substance, except physiological salt solution, is capable of injuring the endothelium, and I am inclined to agree with him that, in spite of certain statistics, the ranks of those who adopt this procedure are rapidly thinning.

(3) Finally, I wish to add a *résumé* of those procedures which I believe are safe and proper before and during cataract extraction:

(*a*) Sterilization of the hands of the operator and assistants and of the skin of the region of operation in the manner already described.

(*b*) Disinfection of all instruments with non-cutting edges, or with edges not readily injured, by boiling in a two-per-cent. solution of carbonate of sodium, followed by transference of these instruments to a bath of absolute alcohol, in which they should remain for at least twenty minutes before the operation. When the operator is ready they should be removed from this fluid and their blades freed from the

* *Recueil d' Ophthalmologie*, March, 1892.

† *Von Graefe's Archiv*, Bd. xxxvii., Abth. 4.

alcohol, which is irritating, by dipping them for a moment in a vessel containing boiling water. Sterilization of the cataract-knife by dipping in boiling water, followed by immersion in alcohol, or by the method of Stroschein.

(*c*) Preparation of the ciliary margins, with frequent washing with soap and water, followed by a thorough rubbing with sterile salt solution or, if preferred, a mild antiseptic fluid, and immediately before the operation flushing out thoroughly the conjunctival cul-de-sac with a boric-acid solution applied with some force, or a sterile physiological salt solution.

(*d*) Removal of blood, etc., during the operation with bits of gauze sterilized in steam, and under no circumstances bringing in contact with the wound bichloride of mercury or other irritating germicide in strong solution.

(*e*) Sterilization of alkaloidal solutions by boiling, followed by the addition of a chemical substance, such as a four-per-cent. solution of boric acid, or a 1 to 10,000 solution of bichloride of mercury, care being taken in the case of cocaine, after each application of it to the eye, to keep the lids closed, and thus prevent drying and wrinkling of the corneal epithelium.

(*f*) Careful inspection and cleansing of the margins of the lids, conjunctiva, and lachrymal points, and the naso-pharynx. If the least suspicion obtains, the use of a preparatory bandage, no operation to be undertaken until this may be applied for twenty-four hours without evidence that undue secretion is created.

(*g*) Due precaution at each subsequent dressing to exercise the same care with hands, dressings, and collyria that has been practised at the primary operation.

THE MEASURED EFFECTS OF CERTAIN THERAPEUTIC AGENTS, AMONG WHICH ESPECIALLY ARE LAVAGE, HCl, AND INTRAGASTRIC ELECTRICITY

UPON THE SECRETORY AND MOTOR FUNCTIONS OF THE STOMACH IN CASES OF CHRONIC CATARRH (GLANDULAR GASTRITIS).

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IN selecting a subject suitable for a paper for this Section of the Congress, on consideration none appeared more apt than that devoted to a *résumé* of the results obtained in several cases of chronic gastric catarrh by modern methods of treatment. Though a theme perhaps uninviting to many whose special work lies in other fields, and who, fortunately for themselves, have also yet little personal need for knowledge as to the recent advances in the treatment of gastric affections, it is, nevertheless, a topic of high importance in view of the fact that the majority of cases of stomach disorder encountered are of the nature of chronic catarrh. These form the greater number of cases that the general practitioner is called upon to treat of so-called chronic indigestion, gastric and flatulent dyspepsia, and the like,—symptomatic terms, only significant in their convenient cover for professional ignorance and as assuagers of too inquisitive clientele inquiry.

Elsewhere,* but recently, I reviewed in somewhat elaborate detail the general therapeutics of the various forms of gastritis. A repetition, therefore, would be unnecessary, even though it here were an applied therapy and space permitted it. I have now rather considered less the general than the special treatment, and that by a few important remedies concerning the utility and *modus operandi* of which in certain directions there is still some debate. These are especially lavage, hydrochloric acid, and intragastric electricity. The effects of these have been particularly studied on the secretory and motor gastric functions. In the application of these medicaments certain facts of importance in the therapy of chronic gastric catarrh are developed, especially as to the great utility of combined intragastric galvanism and faradism as a secretory stimulant after failure of other remedies. Conclusions reached in the three cases are in their most important particulars supported by similar observations in a number of other cases in which the partial or complete treatment here outlined was also pursued. Thus, deductions here cited, though drawn from limited data, may be accepted to apply to a larger number of a similar class of cases.

CASE I.—Mrs. C. F., aged fifty-seven. For several years, prior to which digestion and general health have been good, there have been present dyspeptic symptoms, especially aggravated in the past two years, probably through overtaxing physical energy in the conduction of a tailoring business. She never had especially abused stomach. No alcoholic addiction. Her symptoms when first seen in May, 1892, were nausea, anorexia, and epigastric sensations of burning and weight succeeding all food, flatulency, constipation, coated tongue, occasional vomiting after eating, loss of weight (twenty pounds in two years), sallow

* "System of Therapeutics," edited by Hare, vol. ii.

skin, constant slight headache, very irregular, intermittent, weak heart, without enlargement, somewhat prominent temporals, but vessels nowhere noticeably fibroid. She was confined to the house and often to bed, sinking spells occurring at short intervals. The outline of liver dulness was somewhat increased; stomach was slightly dilated; urine was normal in amount; no albumin; urea excretion normal. Under carefully-regulated, though nutritious, diet, the employment of laxatives, and the free use of HCl and of strychnine after meals, some subjective improvement occurred. The heart became absolutely regular under digitalis in *full* doses, but the latter much aggravated gastric symptoms, so could not be long continued. Strophanthus, increased to its maximum dose, formed but a poor substitute. Cactus grandiflorus, however, in doses of forty drops of the fluid extract, admirably replaced it; but though irregularity ceased without these as she became stronger, intermittency, in the shape of an imperfect systole every third to fourth pulsation, was constant when digitalis or cactus was withheld. Nitro-glycerin was taken for a time; this increasing headache, could not be continued.

Employment of the stomach-tube for diagnostic purposes and for lavage, previously objected to, was begun after she had been under observation five months, HCl after meals having been taken quite steadily. Examination of the stomach contents, first made then, showed: absent HCl; pepsin and lab-ferment present; albumoses in but small amount; no peptone; erythrodextrin present; no starch; digestion test negative without addition of HCl to filtrate; lactic acid in large amount; acid salts likewise excessive; much mucus in wash-water.

Daily lavage was begun October, 1892, the water in the first few weeks being medicated with sodium sulphate, bicarbonate, and chloride. Lavage has been continued to the present, with, lately, intermissions of a few days. HCl after meals was also continued quite regularly until intragastric electricity was begun in the ensuing January. A pancreatic preparation before meals was also taken occasionally. Three weeks after beginning lavage, other medication continuing as before, save that cannabis indica and strontium bromide were used for a time for certain local and general nervous symptoms, free HCl was detected in the stomach contents, with a diminution in the quantity of lactic acid and a heightening in the total acidity. From that time to the present, with a single exception,—three weeks after the examination noted above,—free HCl has invariably been found in all examinations. These have been made regularly at frequent intervals to the present. Intragastric electricity was applied daily from January 14 to April 19, in the manner detailed in another part of this paper.

Improvement was striking in all symptoms under lavage, cardiac irregularity ceasing entirely soon after it was begun. No cardiac medicaments have been prescribed since.* Free HCl, which had been absent from the stomach notwithstanding a two months' course of this acid, appeared during the third week of lavage. It was not detected in any save a very low percentage until intragastric electricity had been used for three weeks. The increase was then so decided as to leave slight doubt as to its cause. At the expiration of nine weeks' daily employment of electricity, the percentage of free HCl was practically normal.

The wash-water was nearly always turbid with mucus in the early period of treatment by lavage; as improvement in general condition occurred, mucus was less and less present. Now little or none is noticed, save coincident with exacerbations of attacks of acute indigestion. Muscular strength has largely returned. The general improvement in her condition since lavage and electricity were begun seems quite remarkable. Headache lessened under lavage, but did not disappear until the third week of the use of intragastric electricity. The bowels have been very regular, no laxatives being required. Occasionally, however, a calomel purge is given. Appetite, at first poor, soon became good. She is now constantly hungry, though getting four light meals daily.

The propulsive power of the stomach was at first much impaired, tested both by Ewald's method and by that which I prefer,—Leube's. In the early part of the treatment salol response was much delayed, and the larger part of a moderate dinner could be removed by lavage seven hours after its ingestion. Salicyluric response, when last tested, a few months ago, appeared in

* Intermittence has returned on two occasions since the last time early in June, an imperfect systole occurring with every fourth to tenth cardiac revolution. A return is coincident with temporary aggravation of the gastric symptoms. The cardiac tone has markedly improved. The first sound is normal; the second somewhat accentuated at apex. Pulse-tension is now always raised. This, not readily detectable by the finger, is shown by the sphygmograph. A rather highly nitrogenous dietary and comparatively little exercise is probably a factor in the maintenance of the high tension. There are no indications of renal degeneration.

three-quarters of an hour to an hour, and traces of food in the wash-water are now rarely, if ever, noted at the expiration of six hours after a moderate dinner.

The next case is especially of interest in that a study was made of the effects of various methods of treatment on gastric secretory activity, here almost entirely in abeyance until electricity was tried.

CASE II.—Mrs. M. M., aged thirty-five years. Symptoms of pronounced indigestion of four years' duration. Ailment existing in severe form when case was seen in January, 1893. There were then present discomfort after food, constant flatulence, with noisy, almost continuous eructations of bad-smelling gases and partially-digested, ill-tasting food. Discomfort after eating often amounted to pronounced distress, relieved only by vomiting. She usually vomited after eating, if any save the lightest food was taken. Asserts that she has lost, by actual measurement, in the four years in which she has ailed, between forty and fifty pounds in flesh. Loss in weight seemed evidently largely due to the extremely abstemious diet taken. The bowels were obstinately constipated, not moving without the use of harsh purgatives. Blood has never been vomited. There was no cachexia. Diffuse slight epigastric tenderness existed, but no tumor. The stomach was dilated, the lower level, when partly distended with a pint of water, reaching several inches below the level of the umbilicus.

Several examinations of the gastric contents were made when she first came under observation, before treatment was begun. These showed, at a time when gastric digestion should be at its height, total acidity, 25 to 30, due solely to organic acids and acid salts. HCl was absent from the gastric secretion. No response to Günzberg's test could be obtained until several c.c. of $\frac{N}{10}$HCl were added to 10 c.c. of gastric filtrate.*

In addition to carefully-regulated diet and systematic daily stomach-washing, the early treatment consisted of, at first, for ten days, 5 grains of beta-naphthol and $\frac{1}{20}$ grain of strychnine sulphate three times daily. No improvement. Then, for three weeks, dilute HCl in 15- to 20-drop doses, repeated three to five times, at intervals of from ten to fifteen minutes after meals, the strychnine also being continued. No improvement. Symptoms as annoying as before. Five grains of an active preparation of pepsin were now added to the dose of acid; the strychnine was discontinued; some subjective improvement; vomiting ceased; eructations and epigastric sensations of weight succeeding meals were less; she ate better. All drugs now discontinued for four days. Stomach examination then made (March 7, 1893). One hour after Ewald's trial breakfast, tube in twenty-three and a half inches before outflow readily occurred; 120 c.c. imperfectly macerated roll removed.† Total acidity = 50; free HCl = 0.01 per cent.; lactic acid moderate, acid salts in excess.

The use of pepsin and acid were again resumed. After one week distinct improvement which had been felt under this combination was not maintained. All treatment save lavage and carefully-regulated diet then withdrawn.

March 20.—One hour after Ewald's trial meal 180 c.c. imperfectly-solved roll removed. Total acidity = 25 = organic acids and acid salts. Absent HCl (no response to Günzberg's test until 2 c.c. $\frac{N}{10}$HCl added to 10 c.c. of filtrate). Digestion test made, but record of result lost.

Pepsin and acid in doses similar to those above recorded again prescribed. Improvement in symptoms of indigestion.

April 5.—Stomach examination made. Result practically similar to that immediately preceding. Pepsin now withdrawn and HCl alone prescribed, but in larger doses than before used. Symptoms of indigestion immediately recurred in aggravated form, such as nausea, eructations, and distress after eating. HCl now withdrawn, and 5 grains of pepsin, without acid, ordered, to be taken after meals for five days; food as before, moderate in amount, but largely albuminoid. No improvement. HCl and pepsin in combination re-begun. Symptoms ameliorated somewhat, but she could eat little because of distress produced by a moderate-sized meal.

April 16.—Pepsin and acid stopped; 6

* Usually 2 c.c. to 10 c.c., or 20 c.c. to 100 c.c., of filtrate, showing absent bound HCl. I use this method as a very convenient gauge of the relative amount of *bound* HCl present in stomach examinations in which no response to free HCl is obtained by Günzberg's solution.

† The method employed for the removal of the stomach contents in these cases admits of a larger quantity being withdrawn than by the expression method of Ewald. The latter averages about 40 c.c., the former about double this. In this case 120 c.c. (with 270 c.c. (℥ix) of fluid taken) indicates both diminished absorption and propulsion. The method employed for removal of the stomach contents in all these cases is that described in my paper, "A Résumé of some Modern Methods of Diagnosis and Treatment of Diseases of the Stomach."—*Medical News*, February 18, 1893.

grains each of papoid and beta-naphthol after meals ordered. Subjective improvement prompt, decided, and continuous, far more marked than on any previous treatment. After a few days symptoms of indigestion had almost entirely ceased. She ate better and slept well. Papoid continued for one month. Stomach examination, made at end of the second week and again on discontinuing the papoid, showed no change in secretory function, notwithstanding undoubted amelioration in subjective symptoms. All medication was now stopped, save the use of laxatives. The latter, which had been required from the first, were still necessary, lavage and the drugs used other than aperients not affecting the obstinate constipation, which was evidently due to marked atony of stomach and bowel. In a few days after discontinuing papoid, symptoms of indigestion recurred. On May 20, after an examination of the stomach contents showing same conditions as formerly, intragastric electricity was begun and continued daily for six weeks; no drugs, save for about three weeks of this period a nightly dose of aloin, were now taken. Amelioration in all symptoms was noticeable from the first. Improvement was steadily progressive, and at the expiration of the fourth week the bowels were acting naturally, and little or no discomfort was felt after meals. Appetite was good and she ate heartily. Contrary to my desire, she ceased coming for treatment at the end of six weeks, because of practical disappearance of symptoms. Stomach examination was not again made until she was especially summoned for this purpose two weeks after the final application of electricity. There were then, one hour after the trial meal, free HCl present (percentage not calculated); lactic acid and acid salts in traces; total acidity = 30; lab test prompt and decided; digestion test not made; amount removed 60 c.c., well solved. Lower part of stomach was twenty and a half inches from incisors, instead of twenty-four inches, as formerly.

Stomach examinations were repeated a few days subsequently,—on July 23, 25, 26, and 27. On the 23d Javorski's test for the relative amount of pepsin secreted was made; 200 c.c. $\frac{N}{10}$HCl* were introduced into the empty, cleaned stomach, and the amount remaining at the expiration of a half-hour (80 c.c.) was removed. Acidity, 57 = 0.2 per cent. HCl. To a number of 10 c.c. tubes, containing small disks of coagulated egg albumin of equal size, varying proportions of the filtrate from the 80 c.c. were added, $\frac{N}{10}$HCl being used as a diluent. In the undiluted filtrate egg disk was digested in less than four hours; diluted one-half, the disk dissolved in four and a half hours. With a number of other dilutions down to 0.6 c.c. of the filtrate the disks had disappeared in all the tubes when inspected nine hours after placing them in incubator. These tests showed active pepsin secretion.

July 25.—Dinner at noon. Stomach washed at 5.30 P.M.; no trace of food in stomach. Ewald's trial meal now taken (for the first time in the afternoon); 45 c.c. well-solved roll removed; total acidity = 60; free HCl = *0.12* per cent. Lactic acid and acid salts present. Digestion test *positive in three hours.*

July 26.—Ewald's trial meal taken same time as on previous day, after washing the stomach; 50 c.c. well-solved roll removed; total acidity = 50; free HCl, 0.05 per cent. Digestive test, egg disk dissolved within four hours.

Impairment of the motor function of the stomach, permitting stagnation of ingesta, had been a prominent symptom. Seven hours after even a moderate meal the wash-water always contained much food. Improvement in the propulsive power of the stomach under electricity was manifest early. During the latter part of the period of treatment, the stomach, cleaned by aid of the tube each afternoon immediately prior to the electrical application, was found to be invariably emptied in from five to six hours after the noon dinner. The same was the case, with sustained improvement in other symptoms, when stomach-washing was practised on the three afternoons when the above-mentioned test meals were taken and Javorski's test tried.

CASE III.—Miss M. A., aged thirty years. For a number of years during autumn and winter she has had eczema of hands and face. Was consulted for this in November, 1891. Appropriate remedies entirely dissipated the rash, which, however, showed annoying tendency to return. During a bad outbreak of eczema in November, 1892, symptoms of indigestion, from which she had long suffered, became prominent. There were sensations of fulness and weight in the epigastrium; headache immediately after meals and continuing for several hours; flatulency, with eructations of sour, bitter fluid; constipation. They were quite unyielding to such remedies as nux vomica, laxatives, and HCl. For this reason, lavage, preceded by an examination of the stomach

* $\frac{N}{10}$HCl = 0.364 per cent. of *absolute* HCl.

contents, was begun. In the first examination, total acidity = 10 = lactic acid and acid salts; free HCl absent. HCl had been taken for three weeks prior to this and to the beginning of stomach-washing.

Very large quantities of thick mucus were always present in the wash-water at first. Recently, though the first few funnelfuls are never free from mucus, it is present now in much less quantity. For a time a mixture of sodium chloride and bicarbonate, as in the other cases, was used to favor the solution and expulsion of mucus. During the first two or three months of lavage, though tolerance to the tube was early established and no retching caused by its introduction, bile in considerable amount was a common constituent of the water removed. As her general condition improved this was less often present, and finally ceased to appear. HCl after meals has been employed for more or less lengthy periods since lavage was begun. At first it was taken steadily for three weeks, then discontinued for a short time, and subsequently rebegun and continued until April 23 last, when it was again stopped on starting with the intragastric application of electricity. Under lavage, subjective improvement was decided from the outset, and with it, HCl, which previously had not seemed of marked avail for its immediate effect, was now of decided benefit. Sensations of weight in the epigastrium, nausea, and other symptoms indicating imperfect gastric digestion, occurring immediately after food, were promptly relieved by it. These continuing after lavage was begun, were now readily controlled by this acid. The bowels also soon became regular without laxatives, which since have not been required.

Two weeks succeeding the first stomach examination free HCl was present in quantity (amount not estimated) to give a moderate response to Günzberg's solution and to Congo-paper. It has not since been absent in any of the frequent examinations made. Under all forms of treatment, however, after improvement had begun, though the total acidity has averaged about 30, the percentage of free HCl has never exceeded 0.09. For a long time it averaged but 0.03. During the past six months the usual per cent. has been 0.07. Despite this low percentage, gastric symptoms, which had disappeared under the use of HCl and lavage, did not recur for some time after the discontinuance of the former. Intragastric electricity was used daily for two and one-third months, all treatment save lavage being then temporarily discontinued.

Atonic gastrectasis was present when the case first came under observation. The lower level of the stomach extended somewhere below the umbilicus, and the tube for complete removal of the stomach contents required to be introduced twenty-four inches. Dilatation in this case was distinguished from gastroptosis by the employment of Einhorn's gastrodiaphane, which very prettily transilluminated the entire gastric cavity on distending the viscus with 2000 c.c. of water. The lower level is now somewhat above the umbilicus, and the stomach is readily completely emptied with the tube in twenty and a half inches. In this case, like the former, the gastric peristole was much affected, more than seven hours being required to dispose of a light dinner. The average period of gastric digestion is now five and a half to six hours, which improvement has been more especially manifest under intragastric electricity than under the use of HCl or stomach-washing alone.

The beneficial effects of intelligently-applied lavage upon the disordered gastric functions in diseases of the stomach are so well known that the results obtained in these cases of chronic catarrhal gastritis may be stated without other comment than that, though improvement was apparent from its employment in all, less occurred in Cases II. and III. than was anticipated from the nature of the ailment, so amenable in Case II. in many of its chief symptoms to electricity. In Case I. it is interesting to note that improvement was not manifest under a most careful regimen and suitable drugs, such as HCl, strychnine, and the like, until washing the stomach was systematically practised. Under the last, amendment was far more decided than it had previously been, and the appearance in the gastric secretion of free HCl was directly attributed to lavage. Its utility as a secretory stimulant, though more marked in this case when compared with the previous trial of HCl, was less noticeable than that obtained by the use of intragastric electricity. Lavage was without effect on the secretory function in Case II., HCl remaining absent after its long-continued employment until electricity was used for some time.

Marked subjective improvement under lavage occurred in Case III., and free HCl, which was apparently absent from the stomach when washing was started, appeared in the gastric secretion in a few weeks of its steady employment. HCl and nux vomica, both often of some utility as stimulants of gastric secretion, had been previously taken without effect. These were continued for a time, but the benefit accruing,

from the mode of its appearance, was undoubtedly due chiefly to lavage. The improvement, however, in gastric secretion, as shown by the amount of increase in free HCl, was unfortunately of no marked degree under this or what proved in the others a more promising method of treatment.

The beneficial influence of lavage upon the motor function of the stomach, impaired in all, was quite decided in two, as is noted in the recital of the histories. In these two cases, under its use, the stomach emptied itself in a shorter time than had been customary, and the bowels became regular without laxatives. Lavage was without effect upon the gastric peristole in Case II., in which marked atony with gastrectasis existed. Obstinate constipation with delayed gastric propulsion continued, despite the daily employment of stomach-washing for a number of months and the coincident use of HCl. Subsequently, intragastric electricity regulated the peristole and re-established secretion.

The effects of the administration of HCl in these cases, as a secretory stimulant and as a digestant, is of no little interest. Recently* I reviewed at some length the various indications for the employment of HCl in gastric ailments associated with lowered acidity. I demonstrated that the use of this acid, contrary to the view held by many, may be of immediate utility acting as a digestant, though of no service in similar cases administered for a more remote effect,—that of re-establishing its own secretion.† In the first of the present cases, twenty minims to a drachm of the dilute acid were taken in divided doses after meals for about two and a half months, wholly without effect upon its own secretion, free HCl remaining absent from the stomach in all tests made at the time in which gastric digestion is normally at its height. In Case II., HCl was taken intermittently for a longer period in much larger quantity, both alone and combined with pepsin. Free HCl, however, remained persistently absent, except on a solitary occasion, when a fleeting response occurred to tests for it, until electricity was begun. In Case III. secretion of free HCl remained absent even after a three weeks' use of the acid in large doses, but was detected in traces three weeks subsequent to the beginning of daily lavage with antacids. It then gradually increased in amount under the morning stomach-washing and 1- to 2-drachm doses of dilute HCl after meals, until 0.07 to 0.09 per cent. was reached. Under no subsequent treatment has it been possible to increase this amount.

Cases I. and III. derived no immediate subjective benefit from the use of HCl, while its secretion as free acid was absent from the stomach. When, however, it began to appear in traces in the lifted contents after the test meal, immediate relief was always felt from symptoms of indigestion by its employment in full doses. In these two cases a series of experiments‡ demonstrated that the immediate amelioration in symptoms of indigestion occurring was in all likelihood due to the ability of the administered acid to perceptibly increase the very low percentage of free acid secreted to one at which peptonization could more rapidly advance. Benefit was also not improbably due to the stimulating power of HCl over pepsin formation,—to the transformation of inactive propepsin into the active enzyme; for apparently only thus could be explained the fact that after the use of this acid at the time of the trial meal, the digestion test with the filtrate from the lifted contents, which in previous examinations when acid had not been taken, was negative, now resulted positively.

In neither of these two cases was the administration of pepsin indicated. In Case II., however, absolutely no improvement resulted from the use of HCl alone, without pepsin. In this case, in which secretion of HCl was in abeyance throughout the period of medical treatment, except for a very brief time, response to tests for bound as well as free HCl being absent on all save one occasion, several trials were made of HCl as a remedy taken after meals, both without pepsin and again combined with it. The results were invariably that symptoms of indigestion were either unrelieved or aggravated by the acid when prescribed without pepsin and apparently always assuaged by the use of the combination. That the benefit could not be due to pepsin alone, as naturally would not be supposed, was shown by its subsequent trial without HCl being totally without effect.

* See "A Consideration of some Modern Therapeutic Agents in the Treatment of Diseases of the Stomach."—THERAPEUTIC GAZETTE, February, 1893.

† This latter I barely touched upon, and the observations as to the former, though the results were conclusive, were only preliminary. In a paper in preparation—"On the Rational Employment of HCl in Certain Gastric Affections"—the whole subject will be fully considered from a practical experimental stand-point, and various modes of administering HCl, with their effect upon the secretory function and upon digestion, will be examined.

‡ See "A Consideration of some Modern Therapeutic Agents in the Treatment of Diseases of the Stomach."—THERAPEUTIC GAZETTE, February, 1893.

The only reason apparent for the utility of the combination, in presence of the failure of acid alone, is that, as in this case * secretion of HCl was suspended, and the percentage of total acidity, representing organic acids and acid salts, was usually low, pepsin formation, through the aid of acids, did not occur even after the administration of HCl; digestion was not, therefore, favored. For it is an established fact that in cases of mucous catarrh without complete atrophy of the tubules, in which HCl secretion is in abeyance, formation of active pepsin no longer occurs from its ever-present potential enzyme,—propepsin. The latter may exist in no small quantity in the mucous membrane, incapable of activity through lack of the presence of adequate amounts of HCl or another acid to aid in its transformation. In these cases of total HCl anacidity, sufficient HCl cannot be administered medicinally after even a moderate meal to both saturate the organic bases, salts, and albuminoids of the food present and materially aid also in the formation of pepsin. But the employment of both pepsin and acid, provided considerable doses are taken, and the amount of food to be disposed of is not excessive, permits digestion to proceed—though imperfectly at best—by aid of the artificial gastric juice, the organic acids present also assisting in peptonization.

It must be stated that in Case II. papoid—a preparation from the *Carica papaya* plant—was also tried. It was taken continuously for a month, at first alone and subsequently combined with beta-naphthol, the latter being added to influence fermentation, originating constant annoying flatulence. Subjective improvement was more decided on papoid, when taken in doses of 5 grains and over, than with pepsin and acid. Relief from symptoms of indigestion were immediate, marked, and continuous during the period in which papoid was used. Subsequently, on its cessation, the patient immediately lapsed into her former condition, without any improvement having occurred in the secretory function of the stomach at the end of the thirty days' trial, as shown by the tests then made. The combination of papoid and naphthol seemed of somewhat more benefit than did the use of papoid alone, less flatulency occurring under the employment of the two. Naphthol had been previously tried when strychnine was also taken, in the early part of the treatment, but, without papoid, it was of no apparent utility.

* Representing a class in which, with totally absent HCl from the gastric secretion, the use of HCl as a digestant must be almost or totally without effect.

Strychnine, in doses of $\frac{1}{20}$ grain, was employed for a number of weeks in Cases I. and II., but apparently without any effect whatever. For a time, as well, infusion of quassia and calumba were also taken, with soda and acids, alternately.

The remedy of most signal benefit, both for immediate and permanent subjective and objective effect upon the symptoms and their underlying cause, was the intragastric application of electricity. In all the cases faradism and galvanism, and combined galvano-faradization, were employed as follows: The sessions in each case were daily † of from twelve to twenty minutes' duration. The stomach was first washed, if food or much mucus was supposed to be present. A half to two-thirds of a pint of water were then taken, and the electrode swallowed. The intragastric electrode employed was the small-sized, so-called "deglutable" electrode ‡ devised by Dr. Einhorn, of New York, and made for me by Mr. Otto Flemming, of this city. This is beyond doubt the most practicable of the various stomach electrodes suggested, and should always be selected in preference to all others for general use. When its perfect simplicity of application, without more than trifling annoyance to the patient unaccustomed to the tube, is more generally understood, and the benefit that may be derived from intragastric electricity in certain forms of diseases of the stomach is also known, this promising

† My experience with the medical use of electricity—a somewhat large one—has demonstrated conclusively to my mind that failure often attends its application to the amelioration of ailments which, in the nature of things, would be susceptible of relief, or perhaps cure, by the intelligent use of the battery, were sittings more frequent, such as once or twice daily, at least in the early part of treatment. It seems extraordinary that results can be expected in the treatment of chronic ailments other than perhaps the relief of a myalgia or the exercise of a paretic small muscle-group, from a few minutes' application of a current every two, three, or four days. Yet such is the technique of many who use electricity in medicine, and whose results, if *results* are obtained, accrue rather through psychical influence than from any actual direct effect of electricity.

‡ For a description of this electrode and mode of application, see my chapter on the treatment of chronic gastric catarrh ("System of Practical Therapeutics," edited by Hare, vol. ii. p. 925). Mr. Flemming now joins the electrode to a somewhat stout rubber cord insulating the rheophore. This enables it to be introduced into the stomach without more than one effort at deglutition, and does not necessitate the coincident ingestion of water to aid its passage into the stomach. See, also, Einhorn's interesting papers on the subject (*Medical Record*, May 9, 1891, January 30, February 6, 1892; *New York Medical Journal*, July 8, 1893).

method of treatment will probably come into more general use.

A felt pad formed the indifferent electrode. This was placed upon the epigastrium or another portion of the abdomen. The current was applied for some four to five minutes with the patient sitting, then for ten to fifteen minutes while in recumbency, alternately supine and upon the left side, to bring the current's influence, by aid of the water ingested, to all portions of the gastric parietes, and especially to those parts in which the chief secreting structure resides. When applications were made at the office, an equal portion of each electrical session was given to faradism and galvanism—a few moments each to anode and cathode—and to galvano-faradization. The strength of faradic current employed was one that could be comfortably borne; the same was the case with the galvanic, which latter, however, was always accurately measured, and lay between ten and twenty milliampères. Case I. received the combined current daily for three weeks and then every third day, using faradism daily at home. Applications were continued daily for three months. They were then discontinued on subsidence of all symptoms and re-begun and continued for a week or so at intervals when electricity seemed indicated from revival of symptoms.

Case II. received the combined method daily during the whole course of six weeks' electrical treatment. A similar method was pursued with Case III., at first on alternate days and then every third to fourth day, she using faradism daily at home, the whole being continued for nine and a half weeks.

In Case I. the percentage of free HCl present before electricity was begun lay between 0.01 and 0.05, the latter never being exceeded. From these figures, without other treatment than the intragastric application of electricity,—lavage, of course, being continued,—it rose in three weeks to 0.1 and in six weeks more to 0.14, about which figure it has since stood, except during periods in which, either from indiscretion in diet, inattention to bowels, or a lack of exercise in fresh air, the general health temporarily declined. The intragastric application of electricity apparently excited a markedly bracing effect upon the general condition, as well as upon the mere local disturbance in the stomach. A sensation of vigor was imparted by its use lasting several hours, and, under it, slight headaches, which had persisted for months, totally disappeared.

Case II., when electricity was begun, I had viewed as almost hopeless regarding improvement to be expected in impaired gastric secretory or motor power, hitherto unyielding to lavage, HCl, strychnine, and other approved remedies. She, however, reacted to the battery in a manner surprising indeed. Totally without other medication, save for a time laxatives, aggravated symptoms of indigestion disappeared entirely and more completely than under any drug hitherto used. Electricity was discontinued after six weeks' daily use. Improvement had been maintained when seen a month after this,* though no drugs had been taken. Several tests of the gastric secretion showed free HCl always present, and in very nearly normal amount. The bowels, which had become regular before electricity was stopped, continue so, and the stomach completely empties itself between five and six hours after a moderate dinner. All of which shows quite extraordinary improvement from the condition previously existing of HCl anacidity and of marked motor atony with stagnation of the ingesta in the stomach.

Case III. displayed no improvement in secretory power under electricity, the percentage of free acid—0.07 to 0.09, the figures reached on starting with the battery—being maintained but not exceeded. Improvement in the motor function was, however, more decided than under the use of lavage, strychnine, and HCl. After a few weeks' treatment by intragastric electricity, the stomach was invariably found empty in six hours after a mid-day dinner, when, formerly, at the expiration of from seven to eight hours, it still contained remnants of food. Epigastric heaviness and other symptoms occurring after meals, indicating imperfect gastric digestion, previously only relieved by the use of HCl, soon disappeared under the employment of intragastric electricity, no HCl being then required. As no visible improvement in secretory power occurred under electricity, the amelioration in symptoms of indigestion was evidently due to improvement in gastric motor tone, obviating undue retention of food in the stomach.

It is of interest to note that in these three cases no reaction for HCl could be obtained from the fluid removed from the stomach at the expiration of a half-hour, after ten minutes' application either of faradism alone or of gal-

* The date of this writing—August, 1893. I am now experimenting with the use of HCl administered in large doses before meals, in this case and in Case III., hoping not only to maintain but to continue to improve secretory activity by this means. A report of the success obtained will be made in the paper preparing on the rational employment of HCl in diseases of the stomach.

vano-faradization, though in two of them a fair percentage of free HCl was present in the lifted contents after the trial meal at the time this test was made. This showed in these cases no immediate stimulating effect of electricity on the secretory function, and is contrary to results obtained by Einhorn.

In conclusion, a study of these cases, in which gastric catarrh was present in aggravated form, and in the two least promising of which the most decided improvement occurred, indicates that in the treatment of this ailment lavage is of service as a cleanser of the mucosa and as a stimulant to the most important of the gastric functions,—the secretory and motor; but that in all effects save the first, lavage is decidedly inferior as a remedy to the intragastric application of electricity; that HCl, administered even in full doses after meals, is of less permanent benefit as a stimulant to its own secretion than for its immediate use as a digestant, and that it may be of little utility in this capacity with total absence of this acid from the gastric secretion; then, however, benefit may occur from its use in large doses combined with pepsin. Finally, that of the various remedies employed in the treatment of gastric catarrh for their influence on secretion and motility, none are comparable with the intelligent daily use of intragastric faradism and galvanism.

2620 North Fifth Street, Philadelphia.

A CASE OF UTERINE MYOMA. HYSTERECTOMY ACCORDING TO A NEW METHOD.

A Paper read before the J. M. Da Costa Medical Society, September 22, 1893.

By John M. Fisher, M.D.,

Instructor in Gynæcology, and Chief of the Department of Diseases of Women in the Jefferson Medical College Hospital.

SEPTEMBER 3, or about three weeks ago, I was called to see Mrs. S., the wife of a physician, who gave the following history: Aged forty-four; married twelve years; three children; last two instrumental deliveries; made good recovery after each confinement; last child born six years ago; no miscarriages. Dates the beginning of present illness back three and a half years, when her menses became more profuse and more prolonged than was normal. She continued to grow worse, until within the past two years the periods recurred irregularly, the intervals covering a week or ten days, the flow continuing from seven days to two weeks, and occasionally longer, the hemorrhages at times being so excessive that the patient was frequently obliged to resort to the use of tampons and take to her bed for days in succession. Although under the constant care of physicians, who had tried every therapeutic resource (excepting electricity) for her relief, including curettement of the uterus sixteen months ago by a well-known obstetrician and gynæcologist of this city, the local as well as the constitutional condition became more and more marked.

She was very much emaciated, extremely anæmic and pale, the buccal and vaginal mucous membranes presenting a bloodless appearance. Anorexia, frequent nausea, insomnia, vertigo, palpitation, and præcordial distress were among the more pronounced symptoms.

A bimanual examination disclosed uniform enlargement of the body and supravaginal portion of the neck of the uterus to the size of a small cocoanut. The diseased organ was freely movable and, although firm, had a semi-elastic consistence. Myoma of the uterus was diagnosticated.

Having learned by experience that electricity in this particular class of cases is of no avail, either as a means to check hemorrhage or to arrest the advance of the disease, and bearing in mind the frequency with which malignancy attacks these growths, operation was proposed and readily accepted by the patient and her friends.

September 10 she was anæsthetized. After the vagina was thoroughly cleansed and firmly packed with gauze, the patient was placed in the Trendelenburg posture, and an abdominal incision made of sufficient length to deliver the tumor, which was free of adhesions. The peritoneum covering the uterus anteriorly was now incised transversely about one inch above its reflection on to the bladder, extending to a point on each side a little in advance of the uterine attachments of the anterior leaflets of the broad ligaments. The peritoneal covering below the incision with the superimposed bladder was pushed off the subjacent structures with the finger-nails until the cervico-vaginal junction was reached, as revealed by the presence of the gauze beneath. Two vertical incisions through the peritoneum from the extremities of the transverse cut and at right angles to same, extending along the anterior surface of the uterus and somewhat in advance of the broad ligaments, were next made, and the serous covering pushed off as before until the connective tissue between the folds of the ligaments in which were located the uterine and ovarian arteries was reached. A right-angled curved

ligature-carrier armed with stout catgut was next passed from below upward through the exposed connective tissue, entering at a point just above the vaginal vault, close to the cervix (thus avoiding constriction of the ureter), and taking in sufficient tissue in depth and thickness to insure ligation of the uterine artery, carefully avoiding, however, perforation of the posterior leaflet of the broad ligament. The carrier was released and the ligature tied. Subperitoneal ligation of the ovarian artery was performed in a like manner. This being done on both sides, the peritoneum covering the posterior aspect of the diseased organ was incised on lines corresponding to those made on its anterior surface, and detachment of the same accomplished as before with the finger-nails. The supply-vessels cut off, the body and the supravaginal neck of the organ were freed from remaining attachments, without fear of provoking hemorrhage, and removed, the organ being severed with a scalpel immediately above the level of the cervico-vaginal junction. The mucous lining of the remaining portion of the cervix was excised by a circular cut and the raw edges touched with deliquesced carbolic acid. The opening in the cervix was closed by inverting its margins and stitching with a running suture of catgut. The gauze packing was removed from the vagina and the tissues allowed to retract to the sides and bottom of the pelvis. The opposing cut edges of peritoneum at the floor and of the leaflets of the broad ligaments on each side were now folded in (inverted) and the corresponding serous surfaces united by a Lembert continuous catgut suture. The ligatures surrounding the ovarian and uterine arteries having, as indicated, been placed between and below the cut edges of the broad ligaments, these, as well as the remaining portion of the cervix, were thus buried beneath the serous surface and therefore excluded from the peritoneal cavity, the site of the completed operation in the pelvis presenting a single line of suture of crescentic outline extending transversely across its floor. The abdomen was closed without drainage.

Save that the patient had considerable gastric disturbance for several days following the administration of the anæsthetic,—to which it was no doubt due,—the post-operative behavior of the case has been very satisfactory. The highest temperature (100.8° F.) was recorded on the seventh day. Since then she has been free from fever. The abdominal stitches were removed on the eighth day, firm union obtaining along the whole line of suture. She is free from pain, her bowels move daily, and her general condition is all that could be desired at this date, twelve days after the operation.

Save in one particular (closure of the canal in the cervical stump), I believe the method of operation adopted in this case to be the nearest approach to the ideal that has yet been practised for the removal of uterine fibroids, and a more extensive experience will, I am confident, confirm the practicability and value of this most scientific of surgical procedures. The ligation of the cervix in mass, as practised by Schroeder, and dropping the same into the pelvic cavity, although warmly advocated, was soon superseded by the much safer, though apparently crude, method of fixing the pedicle in the lower portion of the abdominal wound and treating it extraperitoneally; and now this latter mode of procedure, held in such high favor by most operators of the present day, is likewise destined to a more limited practice, and in time may be abandoned altogether, giving way to the recently improved technique which insures the safety of the pedicle within the pelvis. This has already been demonstrated as practicable by a sufficient number of cases in the hands of Baer, of Philadelphia, as well as by others working on the same lines, to place their claims, in the main, beyond dispute. The plan of operation adopted in the case reported is simply a step in advance of that practised by Baer. He likewise ligates uterine and ovarian arteries, but in connection with other tissues, including peritoneum, *en masse*, thus leaving the ligatures with large raw and exposed stumps free in the peritoneal cavity, there to contract adhesions and give rise to whatever other mischief they may be capable of provoking. In our case all the ligatures, cervical stump, and raw cut edges were buried beneath the peritoneal lining, the line of suture itself consisting of opposed smooth serous surfaces held together by absorbable catgut. The anatomical conformation of the vagina was preserved and a floor to the peritoneal cavity secured, with a closed serous sac approaching the normal more closely than could be obtained by any other known method, which is in striking contrast to that of the weakened pelvic roof and the shortened and strictured vagina, the result of total extirpation.

Upon reflection, I have but one point to offer in criticism of the operative technique as practised in this case. While the patient has done extraordinarily well, nevertheless I consider invagination and closure of the cervix a fault and a possible source of trouble should it be adopted in subsequent operations. Uniting the opposing

peritoneal flaps and closing the cervix as indicated leaves a closed cavity the sides of which consist of raw oozing surfaces, and is therefore liable to become a nidus for accumulating fluids and infection. With the vagina antiseptically treated and packed with gauze, the portion of the cervix allowed to remain could be treated by excising, or dilating and cauterizing, its lining membrane, and then carrying a piece of iodoform gauze through the canal into the vagina; good drainage would thus be provided for this limited area of possible danger. Any excess of gauze in the vagina militating against the comfort of the patient could be removed, but sufficient should be allowed to remain to preserve an antiseptic condition of the parts for at least a few days, or until the cervical drain could be dispensed with.

In conclusion, I wish to state that the operative plan in the case reported was first suggested to me by Professor E. E. Montgomery, to whom I am indebted for assistance in carrying out its details.

October 6, 1893.—Patient left the hospital for her home to-day (two days less than four weeks after the operation). She is free from deleterious post-operative sequelæ, and is fast recovering from a state of chronic invalidism that characterized her general condition for more than three years.

1527 Wallace Street.

REPORT UPON CASES OF TUBERCULAR LARYNGITIS TREATED IN COLORADO SPRINGS.

By S. Edwin Solly, M.D.

I DESIRE to report to you the general features and results of forty-five cases of laryngeal tuberculosis treated by me in Colorado Springs, which place stands at an altitude of six thousand feet.

I have gathered together two hundred and fifty cases of pulmonary tuberculosis, and the forty-five cases are all of these in which there was unmistakable evidence of laryngeal tuberculosis.

These two hundred and fifty cases are not all the cases of pulmonary or laryngeal tuberculosis treated by me during the eighteen years of practice in this region, but are all that I had opportunity to follow out and watch and obtain such knowledge of as would enable me to speak definitely of their progress and results, and in order to allow a reasonable time to have elapsed before reporting, I have taken no cases that were seen for the first time in the past two years, and only those that were treated by me personally. As far as these conditions allowed, the cases were taken as they happened to come, and may be considered as fair samples of what the total of the cases would probably show if all the records had been complete, and this opinion as regards the whole two hundred and fifty cases is confirmed by their similarity in quality and results to the cases reported by other observers treated in this and similar altitudes. I could obtain no reports of laryngeal cases alone to compare them with, as to results; reports of cures of laryngeal tuberculosis after treatment are reported, but few that I know of that have been any length of time under observation. It will be observed that in the duration of the disease there is a relative likeness to reports of cases in low climates as given by others, and also a near resemblance in the percentage of laryngeal cases among the whole number of those with pulmonary tuberculosis, while the percentage in whom ulceration was found is close to that from Schroetter's autopsies, though smaller than Williglk's or Mackenzie's. It is therefore, I believe, fair to infer that the cases are of an average quality, and this is shown by their resemblance to the reports of pulmonary tuberculosis treated at an altitude made by other observers. While these results could not have been obtained without treatment, yet in many of the cases similar treatment previously used in low climates failed of any such results.

Frequency of Laryngeal Tuberculosis among Cases of Phthisis.

Cases reported.

No.		Per cent.
100	Mackenzie. Larynx involved in.....	33.0
193	Louis. Larynx involved in.....	32.6
1226	Heinze. Larynx involved in.....	30.6
250	Solly. Larynx involved in	28.0
100	Mackenzie. Laryngeal ulceration found in	13.0
1317	Williglk autopsies. Laryngeal ulceration found in.....	13.8
723	Schroetter. Laryngeal ulceration found in	6.0
250	Solly. Laryngeal ulceration found in.....	8.0

Twenty-five of the laryngeal cases showed clear signs of tubercular infiltration, which had not, however, proceeded to ulceration at the time of the first examination, though some of them did subsequently, while twenty cases had ulceration as well as infiltration when first seen.

Average Duration.—The average duration of the non-ulcerated cases from the date of their first symptoms up to the present time or death

was six years, while of seventeen of these cases who improved and are living the average duration is thirteen years, and of the eight who are worse or dead it was but three years and ten months.

The total average duration of the twenty cases with ulceration was three years and two months. Of five cases that improved and are living it was eight years and five months, while of the fatal and deteriorated cases it was two years. Of the deteriorated cases with and without ulceration, combined, the average duration was two years and seven months. This is somewhat longer than the two years' limit given by Bosworth.

Position of the Ulcers.—With regard to position of the ulcers, dividing them by the situation of the first or most marked ulcer, it was found upon the false chords in twenty per cent., on the commissure in thirty per cent., and upon the epiglottis in the same proportion; upon the arytenoids in forty-five per cent., and upon the true chords in fifty per cent.

State of the Lungs.—Of the non-ulcerated cases, forty per cent. were in the first stage, thirty-two per cent. in the second, and twenty-four per cent. in the third. Of those with ulceration, twenty per cent. were in the first stage, thirty per cent. in the second, and fifty per cent. in the third, thus showing a close relation between the condition of the lungs and throat.

Results.—These are placed under the following heads: cured, greatly improved, improved, and worse. These terms apply to the entire condition and not to the throat alone.

The cured are those from whom all signs of ill health have disappeared and who have remained well not less than two years. The greatly improved are those who are practically well, but yet show some local signs or trifling disability, or have not recovered long enough to be pronounced cured. The improved are those who, while they may have suffered and are still suffering from their battle with disease, yet show a tendency to recovery, but are still on uncertain ground. The worse include all the fatal cases and the few still living whose tendency is downward.

Non-Laryngeal.—Seventy-eight cured, thirty-six greatly improved, thirty improved, fifty-seven worse.

Laryngeal.—Non-ulcerated: nine cured, seven greatly improved, three improved, three died, two worse. Ulcerated: two cured, two greatly improved, one improved, ten died. Total laryngeal: eleven cured, nine greatly improved, four improved, sixteen died, two worse.

Grouping together the cured, greatly improved, and improved under the head of improved, we find of the whole two hundred and fifty cases of phthisis seventy-two per cent. improved; but of the forty-five laryngeal cases only forty-nine per cent. improved. The non-ulcerated cases, however, showed sixty-eight per cent. and the ulcerated only twenty-five per cent. improved.

Taking the condition of the throat, without regard to the ultimate fate of the patient, the results were much better, there being local permanent arrest of disease in sixty-four per cent., besides five cases which healed temporarily. Among the non-ulcerated alone, sixty-eight per cent. showed a return to normal appearance in the larynx; while among the ulcerated cases, fifty per cent. healed permanently and three cases in addition temporarily.

With regard to the position of the ulceration, the results were: commissure, 33.3 per cent. improved; true chords, thirty per cent.; epiglottis, seventeen per cent.; while of the arytenoids and false chords none improved.

To recapitulate, it may be said that of the whole number of cases—viz., two hundred and fifty—a little more than two out of three improved.

Of the forty-five who had laryngeal disease, one out of two improved.

Of the twenty-five cases in whom there was laryngeal tubercular infiltration without ulceration, a little more than two out of three improved, while of the twenty in whom there was laryngeal tubercular ulceration, only one in four improved; but of the two hundred and five cases without laryngeal disease, there was improvement in nearly three out of every four cases, the exact reverse of the laryngeal ulcerated cases.

This shows, as was to be expected, that the laryngeal complication reduces the chance of improvement, and when it has proceeded to ulceration, does so to the extent of three to one. But even then, according to the opinions expressed by laryngologists practising in low climates, these are far better results than have been obtained, and show, I believe, that similar beneficial, retarding, and often curative effects which have been demonstrated in pulmonary tuberculosis treated in Colorado and other high climates are exhibited in laryngeal tuberculosis. That the results are not quite as good, though relatively so, is of course to be expected, as in all of these cases—and I have never seen a laryngeal tuberculosis without an accompanying pulmonary tuberculosis—there was the double disease and therefore the double

burden to bear. Moreover, there is little doubt that the laryngeal complication in almost all, if not in all, indicates a tendency to a free dissemination of tubercle and generally an absence of any self-limiting features. There are undoubtedly some cases in which the laryngeal tuberculosis is derived from a local inoculation from the sputum from the tuberculous lung lodging on the abraded mucous membrane, but clinical observation leads me to believe that in the great majority of the cases the infection starts from within and not from without.

Taking the results upon the laryngeal disease alone, irrespective of the ultimate recovery or deterioration of the patient on account of the accompanying lung-disease, we find that in 64.2 per cent. there was arrest; and if we consider also the five in whom there was temporary healing, which broke down again under the strain of the last weeks of fatal pulmonary suppuration, we see that the percentage of improvement in the local laryngeal symptoms is not very far short of that of the simple pulmonary cases.

While I believe that, contrary to what was a common impression,—viz., that high climates are injurious *per se* to tubercular laryngitis,—they are positively beneficial, speaking as a generality, yet such results as I report could not be reached without, in the majority, especially in the ulcerated cases, careful local treatment. As Bosworth truly writes, after advocating topical measures, "In no ulcerative process, probably, are we able to detect in a less degree any reparatory effort on the part of nature than in tubercular ulceration, and yet instances of spontaneous cicatrization have been reported by Bouveret, Virchow, Jarvis, and others."

Treatment.—With regard to the nature of the treatment, it must vary according to the appearance of the parts from day to day, and all routine treatment is wrong. But in speaking of general principles, it may be said that the first essential is the toilet of the throat,—that is, the removal of mucus, pus, etc., and the washing of the membrane,—and this is in most cases best procured and with the pleasantest effects by a free spraying with Dobell's solution. The old injunctions were to use sedatives and avoid stimulants to a tubercular larynx. Now, in the majority of cases, if the choice lay only between sedation and stimulation, I would say stimulate; while there is, often continuously, and generally at the onset, hyperæmia and hyperæsthesia of some of the parts, yet the underlying condition is an anæmic one, the congestions are chronic, not acute, and the real good of treatment almost invariably comes from stimulation, ranging from the mild stimulation of weak menthol and nitrate-of-silver solutions, etc., to the cauterization with lactic acid and the scraping of ulcerated surfaces with the curette. Cocaine should of course be used to avoid the pain of treatment, while for pain at other times a spray of antipyrin will generally give a more prolonged relief. I should extend this paper beyond its proper limit were I to enter further into the details of treatment, but may mention that astringents, iodoform, etc., are often of service. I believe in using the cotton applicator, the powder-blower, and the spray as the case demands; also I must mention the valuable aid I derived from the Sass inhaler, particularly with the use of benzoin inhalations.

To conclude, it may be said that the foregoing facts would indicate that while tubercular laryngitis is always a grave complication at an altitude as elsewhere, and when advanced is almost invariably fatal, yet in the earlier and medium cases high altitudes, with appropriate treatment, afford relatively, though not actually, as good a chance of arrest or delay in laryngeal as in pulmonary tuberculosis.

STOMACH-SYMPTOMS DUE TO ABSTINENCE FROM MORPHINE.

Professor Hitzig (*Medizinisch-Chirurgisches Centralblatt*, No. 24) thinks the great distress usually endured by persons when giving up morphine is due to the fact that the stomach is rendered hyperacid by the use of morphine. He gives the history of a young colleague who contracted the morphine habit while on duty at an insane asylum. The mode of treatment was to gradually lessen the quantity of morphine from day to day. The patient had a prolonged warm bath, and had the stomach emptied and then washed out with Carlsbad salt, and at night ½ drachm of trional was given. The observations in this case leave no definite conclusions, as all the usual symptoms of distress were lacking, but further observations may lead to more marked results. During the use of the morphine the hydrochloric acid diminished and almost disappeared, gradually returning when the use of morphine had ceased. Hitzig is inclined to think the morning washing of the stomach with Carlsbad salt was the important feature of the cure. He has given hydrochloric acid to chronic morphine patients, for he deemed it possible that the morphine appetite was caused by the artificially-produced hyperacidity.

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Leading Articles.

CALOMEL CONJUNCTIVITIS.

IT is a matter of common observation that the introduction of calomel into the conjunctival cul-de-sac occasionally is followed by severe reaction and a sharp conjunctivitis. For many years it has been known that this inflammation, with a few exceptions presently to be detailed, occurs during the process of the elimination of iodide of potassium (which is being administered internally) through the lachrymal secretion, this drug under these circumstances combining with the calomel and forming a soluble salt, the irritating action of which becomes manifest in the manner stated.

The type of this conjunctivitis varies in different cases, but generally consists of swelling of the conjunctiva, sharp hyperæmia, profuse lachrymation, and sometimes, especially if the insufflation of calomel is continued (the cause of the trouble being unsuspected), of a positive sloughing of the membrane, or the formation of a gray deposit upon its surface. Indeed, if some of the earlier reports of this affection may be credited, not only do the ordinary phenomena of conjunctivitis present themselves, but there may be extensive swelling of the lids, reddening of the face and surrounding area, together with persistent blepharospasm.

Recently, Friedenwald and Crawford (*American Journal of Ophthalmology*, August, 1893) have reported three cases of this affection, utilizing them as the text for a very interesting and instructive article upon the mechanism of calomel conjunctivitis, and indirectly shedding light upon the manner in which calomel is absorbed into the system. Usually the symptoms appear within an hour after the conjunctiva has been dusted with the calomel, but they may arise earlier, in one instance, noted by the writer of this article, as early as twenty minutes after the calomel had come in contact with the conjunctiva. Experimentally, according to Friedenwald and Crawford, the phenomena arise in about the same length of time. It has been stated by Hirschberg that there is no danger of producing this affection unless the calomel insufflation has followed very shortly after the ingestion of the iodide of potassium. This view, as is pointed out by Friedenwald and his *confrère*, is not tenable, because one observer, using doses of .5 gramme, produced irritation of the conjunctiva with calomel twenty-four hours after the last portion of the iodide had been ingested, and in the cases of the authors from whom we have quoted, the doses of iodide were moderate and had not been taken just before the calomel was used. The same is true of the case to which we have made reference, as the last dose of iodide of potassium had been taken early in the morning and the calomel was dusted on the conjunctiva late in the afternoon.

For the most part this inflammation speedily disappears spontaneously as soon as there is cessation in the use of the calomel, and without leaving any serious results. Occasional exceptions to this rule occur. One, quoted in the article to which we have referred, did not recover until eleven days had elapsed, in spite of vigorous treatment, while symblepharon developed in another instance. Although its sharp limitation to that portion of the conjunctiva which comes in contact with the calomel, hence usually the lower retrotarsal fold, is characteristic of the affection, exceptions to this rule have been reported. So, also, instead of being monocular, occasionally both eyes are involved, and in bad cases the entire conjunctival

cul-de-sac may be inflamed, and, in experimental instances, the corneæ may grow hazy and infiltrated. In the vast majority of the cases these untoward results have occurred when the ingestion of the iodide of potassium has been through the mouth. It should be remembered, however, that like phenomena may arise from the external use of the drug, as, for example, in one case where a solution of iodide of potassium was applied to an inflamed testicle, or when it is given hypodermically.

Friedenwald and Crawford quote the studies of Schlaefke and Fleischer in explanation of these phenomena as follows: Calomel, in the presence of animal fluids containing sodium chloride, and under the influence of the body temperature, is slowly converted into bichloride and free mercury. As the transformation into the bichloride is slow and small in quantity, it is believed that the clinical action of the drug on phlyctenulæ, etc., is due to its power in the nascent state. The following reaction is probably correct: $2HgCl = HgCl_2 + Hg$.

In the remainder of this interesting communication the absorption of calomel into the system, as well as the elimination, is further elucidated. For the details of the chemical data the original article must be consulted. The conclusion of the whole matter is summed up as follows: 1. Part of the calomel is transformed into bichloride. 2. The potassium in the tears combines with this bichloride, forming the mercuric iodide, and, meeting the rest of the calomel, produces mercurous iodide, part of which, in turn, gives rise to mercuric iodide and metallic mercury, while the remainder combines with the excess of potassium iodide, forming a double salt with liberation of free mercury. 3. Mercuric iodide arising from the combination of the bichloride and potassium iodide, and also from the decomposition of mercurous iodide, combines with the potassium, forming a double iodide. 4. Both the above double iodides, dissolving in solutions of potassium iodide or of sodium chloride, act as caustics.

There is one other possible source of calomel conjunctivitis,—namely, from impurities in the drug. One of the best-known instances of this is a report of the serious effect of calomel upon the eye by Dr. Hotz, of Chicago, who observed an instance of severe inflammation when calomel was dusted into the conjunctival cul-de-sac of a patient who was taking no other medication than quinine. The calomel was examined, and a considerable quantity of free hydrochloric acid discovered. The chemist who made the examination, after reverting to the fact that at the temperature of the body the chloride of sodium which is present in the tears can convert a little calomel into bichloride of mercury, stated, further, that this alteration is greatly favored by the presence of free hydrochloric acid; hence in this instance there was a more rapid formation of corrosive sublimate and, consequently, a greater caustic effect.

It is not improbable that a similar, although less severe, reaction would occur when the bromide of potassium was being administered internally, and, indeed, like effects under these circumstances have been reported by at least one observer.

THE USE OF SALINES IN PERITONITIS.

THE use of salines in peritonitis in place of opium has become such a favorite method of treatment with a large number of practitioners, and has been so praised by many abdominal surgeons, that the limitations of their employment should be very distinctly understood. But by no means all cases of inflammation of the peritoneum indicate the use of saline purgatives, and in some instances there is little doubt but that their administration does harm. Without meaning in this article to argue for or against the employment of opium, we believe that, in some instances at least, the saline treatment possesses disadvantages more grave than those which may follow the administration of opium. As we have pointed out on other occasions, the use of saline cathartics at any time in abdominal disease, unless the physician has every reason to believe that the alimentary canal is intact, may be followed by the extravasation of the intestinal contents into the peritoneal cavity through a perforation in some part of the gut, more particularly through the ulceration of the appendix. If it is remembered that there are those who assert that practically all cases of peritonitis in the male are due to trouble in the appendix, there is all the more reason for exercising care in the use of the saline treatment in peritoneal inflammation.

After operative procedures upon the abdominal contents, where peritoneal symptoms develop, the surgeon has every reason to believe, from the recent examination of the abdominal contents, that these organs are intact; but in any case prior to operation doubt must always exist.

We have been led to the reiteration of these important facts by a letter which has been addressed within the last few weeks to the editor of the *Boston Medical and Surgical Journal* by

Dr. Maurice H. Richardson. His remarks upon this subject are so in accord with our own views, and emphasize so strongly the importance of the caution necessary, that we take the liberty of reprinting what he has said:

"I wish to say a word against the use of saline or other cathartics in the early stages of appendicitis, because you have recently published articles on appendicitis in which the use of cathartics, especially salines, has been advocated.

"The theoretical action of cathartics in peritonitis, as given by various men, consists in an absorption and removal by intestinal drainage of the toxic products of certain micro-organisms which, multiplying in or near the peritoneal cavity, endanger life. I do not object to carrying out this theory after the appendix has been securely tied, or after it is clear that there is no danger of rapid extravasation; but in the first forty-eight hours of appendicitis I look upon the administration of salines as extremely dangerous, and as a not infrequent cause of general peritonitis and death. The reasons for this lie in the pathological conditions that exist in a very considerable percentage of cases. If, in a given case, there is a perforation in an appendix of large lumen, salines, by liquefying the fæces and increasing peristalsis, *will cause an immediate and almost invariably fatal extravasation.* In such a pathological condition, which is not infrequent, the use of cathartics before removal and ligation of the appendix must be and is attended by most fatal consequences.

"There is the same objection to the use of salines in gunshot wounds of the intestines, in perforations of typhoid fever, or in perforating ulcers of the intestinal tract generally.

"In catarrhal appendicitis without perforation—the mildest of diseases—there is no hurry to produce catharsis. Should the perforation suddenly occur, by keeping the bowels quiet you avoid the danger of rapid extravasations and give the surgeon a chance to remove the appendix before a general peritonitis makes the outlook hopeless. In a localized peritonitis, if no surgical interference has been made, the recent adhesions may be ruptured by fresh extravasations forced along by a stimulated peristaltic *vis a tergo*, and a general peritonitis quickly develop.

"These objections to the administration of salines are based upon a very considerable experience. I may say that a majority of the fatal cases of appendicitis have been attended by extensive fæcal extravasations. I do not mean to assert that these extravasations have been caused in every instance by the administration of saline cathartics, but I do mean to state most unequivocally that they have been so caused in many cases, and that, furthermore, the existing conditions of general spreading peritonitis, far from being curable by salines, are, in my opinion and experience, beyond relief even by the most radical surgical measures, except in very rare instances. Moreover, in these extraordinary cases where, in a fully-established peritonitis, recovery, with or without operation, takes place, I believe we shall find that only comparatively innocuous micro-organisms are present; on the other hand, the explanation of certain fulminating cases, even if apparently trivial at the outset, lies in the presence and rapid reproduction of germ colonies of great vitality and virulence. In either case I am convinced the action of saline cathartics has very little to do with the result, except in certain instances, for the reasons above given, to hasten the fatal end.

"If the appendix has been tied off, or if the peritoneal cavity has been walled off with gauze, or if there is a firmly-localized peritonitis, I do not object to cathartics, and I use the salines freely. I must say, however, that in a completely-established general peritonitis, from whatever cause, with distention, vomiting, and obstipation, in my experience, salines accomplish absolutely nothing.

"To produce 'intestinal drainage' after abdominal operations I think salines most excellent, and they have their use in the very beginning of a peritonitis in which there is no question of extravasation. I believe the future use of salines will be confined to these conditions."

THE VALUE OF CREOSOTE IN GASTRIC FERMENTATION.

CREOSOTE has been so largely used within the last few years in the treatment of bronchial or general pulmonary disease that many of us have forgotten the valuable results to be obtained by its employment in the treatment of gastro-intestinal troubles associated with fermentation. As is well known, the name of the substance is derived from the fact that it was found to prevent decomposition of nitrogenous matter, and that it therefore acted as a distinct antiseptic. There are two classes of cases of indigestion or disorder in the alimentary canal in which creosote is of great value. Aside from those instances of persistent vomiting, where by its local action it often renders us great service, it is also useful in

those cases of fermentation or chronic indigestion in which there are formed large quantities of flatus some time after eating. Whether the distention is caused by the fermentation of starches or the decomposition of nitrogenous materials, a minim or two of creosote half an hour or so after eating, or immediately after eating, will often help such cases. Another instance in which creosote is of value is in a case of severe acute gastro-intestinal fermentation, which is often manifested, in the more severe cases, by an actual attack of cholera morbus. The administration of creosote in such an instance not only tends to prevent the vomiting, but to inhibit the production of poisonous products which are developing from the bad food that the patient has been unfortunate enough to take. Here, again, the dose of from 1 to 3 minims of creosote, well diluted, proves of value. In those instances in which the vomiting is too intense to permit the swallowing of much liquid, it may be administered in the dose of from ½ to 1 minim in a tablespoonful of water, milk, or brandy, a few drops of of this mixture being given at a time. Notwithstanding the laudatory statements which have been made as to the value of thymol, naphthaline, and other gastro-intestinal antiseptics, we believe that creosote is the best one which we can employ, and we doubt, if it is administered carefully, that it is as apt to produce disturbance of the digestion by irritation of the mucous membrane as some of the more highly praised and more expensive remedies. It is hardly necessary to add that it is important to use the beechwood creosote and not that derived from the mineral kingdom.

A NEW OPERATIVE PROCEDURE FOR RELIEF OF ENLARGEMENT OF THE PROSTATE GLAND.

IN a very comprehensive study of the present position of the surgery of the hypertrophied prostate, published in the *Annals of Surgery*, August, 1893, and abstracted by the *British Medical Journal* for September 9, 1893, J. WILLIAM WHITE proposes removal of the testicles as a possible means of causing involution of prostatic overgrowth.

With the idea of determining what effect this operation has upon the development of the prostate, White had a series of experiments on dogs conducted by Kirby, the results of which showed beyond all doubt that castration was promptly and invariably followed by atrophy first of the glandular and then of the muscular elements of the prostate, and that there was consequently a coincident reduction in both bulk and weight.

Griffith, in a paper antedating White's, but which was not seen by the latter till his laboratory work was completed, obtained similar results, and cited post-mortem examinations which showed that castration in man exerted a powerful effect on the nutrition of the prostate.

He quotes Hunter, who observed that the prostate of the perfect bull was soft and bulky, while that of the castrated animal was hard and ligamentous. Griffith made an autopsy on two dogs and two cats which had been castrated years before, not for experimental purposes. In all of these animals the prostate had been transformed into a mass of fibrous connective tissue containing the remnants of gland tubules and a few atrophied muscle-fibres. The pig, bullock, sheep, and horse, after castration, exhibited similar changes in the prostate.

Grüber and Bilharz showed that castration in men is followed by similar changes in the prostate.

As to the possibility of employing castration as a therapeutic method in prostatic hypertrophy, White holds that the final answer to this question must be left to the patients. The proposition to thus treat prostatic hypertrophy is so novel as to be startling, though on a careful review of the question it seems quite as reasonable as it was at one time, for instance, to suppose that ovariotomy would exert a marked influence on uterine fibroids. Indeed, White states that "if we can promise equivalent results there will be no lack of cases willing to submit to an operation almost painless, with low mortality, and accompanied by no such unpleasant conditions as follow fistulous tracts either suprapubic or perineal, even though the operation carries with it the certainty of sacrificing whatever sexual power has survived the excessive and often intolerable sufferings of such patients."

Mansell Moullin, in commenting upon this new proposition, freely accepts the teachings of experimental work and of post-mortem examinations upon the human as showing the relation between the testicle and prostate, but holds that what is now wanted is definite information as to the effect of castration upon the prostate when it is becoming abnormally large in old age.

Reginald Harrison makes an imperfect contribution to knowledge in this direction by reporting a case upon which he operated some years ago. This was never published until

White's paper brought the subject into prominence.

Harrison was consulted by a patient having a large prostate, for the cure of which the patient desired castration. This patient was familiar with Hunter's experiments and with cases in surgery which seemed to support the theory that castration might modify the prostatic overgrowth. Harrison refused to perform castration, but disconnected the testes and the prostate by subcutaneous division of the vasa deferentia immediately below the external abdominal ring. The patient experienced benefit from the operation and was living some years afterwards.

Finally, Griffith quotes Rocum as having performed bilateral castration in two cases for the purpose of favorably affecting an enlargement of the prostate. The first patient operated on was seventy-three years old. There was perceptible diminution in the size of the enlarged gland in three days. Instead of being compelled to micturate hourly, the patient was required to pass his water only three or four times during the day and twice during the night. Similar results were obtained in the second case. Rocum's communication was simply preliminary, and was probably in consequence of White's suggestion, since it appeared more than a month after his article.

As to whether or not castration will become a recognized therapeutic measure in the treatment of enlarged prostate, the answer can only come from clinical experience of cases. This experience will undoubtedly be forthcoming, but to be conclusive must embrace more than two or three, or even more than twenty or thirty, cases. It is quite certain that the method will not be applicable to all cases. It is readily conceivable that if it is applied in but few cases, those least likely to be benefited by it might be chosen. It is quite possible that it will not be beneficial in any cases. It seems reasonable to suppose, however, that it will be found serviceable in certain forms of prostatic growth, to be determined by clinical experience, and that it may become a recognized method of treatment. If it affords us a means of curing or even relieving a small percentage of prostatics, it will be quickly accepted both by surgeons and patients, since, in marked contrast to prostatectomy, it is an operation easily performed and attended with practically no mortality.

Moreover, as has been clearly pointed out, the sacrifice of the testicles will be rarely required till the time of life is reached when these glands are functionless.

Reports on Therapeutic Progress.

SPECIFIC TREATMENT OF TYPHOID FEVER.

DR. EUG. FRAENKEL (*Deutsche Medicinische Wochenschrift*, October 12, 1893) treated fifty-seven cases of moderately severe typhoid fever with diluted cultures of the specific bacilli which cause this disease.

Into sterile thymus bouillon in test-tubes was placed, by means of a platinum wire hook three millimetres in diameter, a quantity of the culture of typhus bacilli from oblique glycerin agar, and the tubes kept for seventy-two hours at a temperature from 97° to 98° F. At the end of this time, after satisfying himself, by re-transmission on the agar, of the luxuriant development of the typhus bacilli in the thymus bouillon, the glass containing thymus-typhus bouillon was placed on a water-bath and heated to 145° F. After it had cooled another transmission on oblique agar attested its absolute sterility. Now the fluid was ready for use.

At first he made subcutaneous injections in the region of the iliac fossa, after first thoroughly washing the skin and spraying it with ether and disinfecting the syringe. As the injections, when made in the ilio-hypogastric region, occasioned pain and caused some reddening of the adjacent skin, the lateral gluteal region was chosen, and the injection made deep into the muscle. Here it proved nearly painless and there were no further signs of inflammation.

The dose and the frequency of the injection are important. The smallest quantity, even for children, of the prepared bouillon was ½ cubic centimetre. The cases were carefully diagnosed by three persons. Twelve of the fifty-seven treated were very ill, the others might be called average cases of moderate severity.

When the patients had been for one or two days under control, the first injection of .5 cubic centimetre was made in the gluteal region. There was usually no change following this. The next day the dose was doubled and the injection made on the other side. Following this the majority of the patients showed an increase in temperature, occasionally accompanied by a slight or severe chill. On the third day of treatment there was a fall of temperature, which after another twenty-four hours was still more marked, sometimes from one-half to a whole degree lower than the temperature at the beginning.

If the treatment was interrupted the temperature rose again. This shows the time for a

repetition of the injection with an increased dose. This time 2 cubic centimetres were injected and the same lowering in temperature occurred, reaching the lowest point after two days. The course of the temperature decides the further course. As soon as the temperature ceases to rise above normal the injections are interrupted, but otherwise they are continued at intervals of two days, and with an increase in the dose each time of 1 cubic centimetre.

The continued fever is almost without exception broken up; from the beginning the fever assumes an intermittent character, and entire absence of fever occurs in a relatively short time.

Of course the rapidity of cure varies with the patient; in general, those who have entered the hospital late are slowest in improving. The earlier relief goes hand-in-hand with a corresponding and often marked improvement in the general conditions, which is not inconsiderably aided by the profuse perspiration which accompanies the fall in temperature. Along with this there is a more or less rapid diuresis, and in not a few cases they pass from two thousand to three thousand cubic centimetres of urine.

The typhoid diarrhœa which most of the patients had ceased when the temperature fell. The patients look like individuals in full convalescence, even while roseola and a splenic swelling still exist.

In a few cases, indeed, after the beginning of defervescence the eruption of roseola occurred, just as the palpable spleen persists after the entire cessation of fever. But these symptoms disappear, and in the mean time the patients rejoice in excellent general health, an increase in weight sometimes occurring.

The patients can be better nourished, and on leaving bed, fourteen or sixteen days after the fever has ceased, are much stronger than when treated by the expectant plan.

This treatment does not prevent relapses or the usual complications. The relapses can be treated as at first. Fraenkel does not suppose that all cases can be cured by this method, but he feels that it produces a regularity and rapidity in the course of the disease which no former mode of treatment obtained.

THE TREATMENT OF TYPHOID FEVER WITH DEAD CULTURES OF THE BACILLUS PYOCYANEUS.

Professor Th. Rumpf (*Deutsche Medicinische Wochenschrift*, October 12, 1893), incited by Dr. Fraenkel's experiments in the Hamburg hospital, and remembering that varioloid and cow-pox render immune from kindred diseases, determined to learn whether a like therapeutic result could not be obtained by the introduction of dead micro-organisms which were not connected with the disease as a cause. The desire was to make use of such micro-organisms as would not, unless under very special circumstances, result in a severe illness.

The first preparation of which he made use was prepared from pure cultures of the streptococci, but as it produced no action to compare with that obtained by Dr. Fraenkel, recourse was had to dead cultures of the bacillus pyocyaneus. The use of these gave results differing only slightly from those obtained by Dr. Fraenkel.

As soon as the diagnosis of typhoid fever was certain, .5 gramme of the preparation, which was prepared just as Dr. Fraenkel did his, was injected, all the aseptic precautions being observed.

At first he injected into the forearm, but as this was followed by a painful redness and swelling, the gluteal muscles were chosen. The results only differ from those obtained by Dr. Fraenkel in being slightly less favorable. Professor Rumpf thinks that the question whether, after further experiments, typhoid fever shall be treated with dead cultures of the typhus bacilli or the pyocyaneus cultures, is less important than the fact that a human disease may be influenced by bacterial products which are quite different from those which produced it.

THERAPEUTICS OF THE MASTOID.

After a careful account of the delicate portions of the middle ear and the great probability that an inflammation affecting one part will extend to all, Dr. Albert Bing (*Centralblatt für die Gesammte Therapie*, June, 1893) proceeds to answer the question as to why the inflammation of the mastoid is so varied in its course. He believes this difference is caused on the one hand by the anatomical structure of the mastoid, and on the other by the physical condition of the patient.

We distinguish between the diploetic mastoid, which consists of larger and smaller cells communicating with each other, and the pneumatic mastoid, which is composed of one large or numerous small vesicles partly separated from each other by thin walls of bone. When there is inflammation in the diploetic mastoid it occupies more space, being swollen, and but little room is left for free discharge; hence the thin bony partitions easily become involved in the in-

flammation,—osteitis. If this occurs in a patient not affected with any dyscrasia, and relatively strong, it is more likely that involution will occur, for the slight quantity of matter enclosed in the cells finds a large absorption surface and can readily be taken up and the swelling and inflammation be overcome.

But in a pneumatic mastoid the matter is collected in a mass and finds a relatively small surface for absorption, so that the absorption of the discharge can scarcely be hoped for, especially if the patient is feeble.

In the case of a strong individual, no matter how plain the symptoms, he would use expectant treatment, and only operate when severe pain and high fever made it necessary; for a feeble person he would hasten the operation.

CLINICAL EXPERIENCES WITH THE CATHARTIC ACID OF SENNA.

Dr. Karl Dehio, of Dorpat (*St. Petersburger Med. Wochenschrift*, No. 27, 1893), refers to the fact that the active principles of rhubarb, frangula, and senna possess very close chemical relationship, or are perhaps identical. He has experimented clinically with the cathartic acid obtained from senna by Gentz, which he believes to be more constant in its composition and more likely to be pure than that previously obtained by Keebly.

Dehio administered it to twenty-one persons, giving adults 2½ grains and children $\frac{5}{6}$ grain. This dose was somewhat too large. It did not fail in any case; the bowels were moved in the majority of cases in from eight to twelve hours, exceptionally earlier or later. In some cases it caused pain, but it was less likely to do this when it acted slowly. It appeared to act best in obstinate constipation.

TREATMENT OF DIABETES MELLITUS.

Dr. Josef Gruber (*Centralblatt für die Gesammte Therapie*, xi., 1893) reports a case of diabetes mellitus, which he treated first with extract of myrtle, as recommended by Dr. Weil (*Klinische Hydrotherapie*, March). At first the patient appeared to gain under this, and there was a slight diminution in the amount of sugar found in the urine. However, as the improvement was not kept up, it evidently was caused chiefly by the more hygienic mode of life in the hospital. Tables are given showing the exact state of the urine from day to day.

When satisfied that no improvement could be looked for, Gruber tried piperazin for five weeks. The dose was 15 grains, dissolved in soda-water, during the course of each day. This gave better results, although the patient lost slightly in flesh. There was more lessening of the sugar secreted, and the patient's general condition was much more comfortable. Tables show the results obtained by this experiment also.

THERAPEUTICS OF ABORTION.

Professor Schauta, of Vienna (*Med.-Chirurg. Centralblatt*, No. 26, 1893), does not advise active interference on the part of the physician in early abortions. The three symptoms of abortion are hemorrhage, pain, and changes in the cervix uteri. Pain usually precedes hemorrhage, and the cervical changes follow; but hemorrhage may come first, and then pain; and rarely contractions of the uterus continue some time unnoticed, because they are unaccompanied with pain. In these cases dilatation of the uterus has occurred first.

The first question to be answered before treatment is, Can the abortion be prevented or not? An abortion is preventable so long as the cervix is not patent and the hemorrhage has not reached a threatening degree. Schauta says he has seen many cases in which there was severe hemorrhage for a short time, but with recovery without abortion. He does nothing to check the bleeding, but watches the patient. If the pain and bleeding subside, and the os does not open, abortion has not occurred, and the patient is kept in bed for eight days after the last bleeding.

In unpreventable abortion,—that is to say, in cases in which the finger can enter the cervix, or when the os is contracted, but a severe hemorrhage has occurred which cannot be disregarded,—then the most dangerous symptom, the hemorrhage, must be controlled. To do this the abortion must be hastened, but not by emptying the womb with the finger or curette, because of the danger of leaving fragments of membrane behind. Instead, Schauta takes a strip of iodoform gauze about two yards long and three to four finger's-breadth wide, and firmly packs the entire vault of the vagina, allowing the end to hang out of the vulva. He says two fingers of the other hand are a better guide in tamponing than a speculum.

If characteristic sacral pains occur, indicating that the embryo has been expelled, the tampon may be pulled out; in the absence of such symptoms, it should be removed in twenty-four hours, lest it should have become a source of septic infection. Then, if the abortion is

not yet complete, and bleeding still exists, it should be replaced, especially if the os is more dilated than the day before. If there is no bleeding and the os is not more dilated, he advises to wait, in the hope that the embryo has not yet separated and that abortion may be checked. If bleeding persists, tamponing may be safely kept up many days, provided that the tampon is renewed every twenty-four hours. In this way, as a rule, the intact ovum is obtained, whereas by more energetic methods it is crushed.

If, however, under tamponing the os is dilated so as to admit two fingers, but the ovum does not come away, then interfere actively. Introduce two fingers into the uterus, and with the other hand grasp the fundus and move it about over the two fingers, carefully and slowly separating the egg from the uterus. It should now be pressed out if possible. If it be too large for that, grasp it with forceps. The sac may rupture, but this is of no moment, since it is loose and comes out whole, not piecemeal. If bleeding still continues, the uterus itself can be tamponed in the same way as described in the case of the vagina.

In the difficult cases of incomplete abortion, in which part of the ovum or membranes remain in the uterus, one has to be guided by the size of the uterus. If it is large, the egg may be entire; if it is small, then only membranes remain. In the former case the treatment is as already described; in the latter case the os must, if necessary, be dilated with rubber or glass bougies and the uterus scraped, with the finger always introduced as a guide.

The interesting cases in which bleeding continues for weeks or months after an asserted abortion are of two kinds: either fragments of membrane remain, or there is an extra-uterine pregnancy. In the latter case there is a history of pain, bleeding, and the discharge of fragments of decidua. The bleeding is apt to be intermittent. There is also a tumor beside the uterus, with a characteristic doughy, soft feel. Such cases require abdominal section.

Cases of habitual abortion can be caused by an hypertrophic endometritis. Scraping and an energetic treatment of the endometrium are required. A frequent cause is a change of position of the uterus, either retroversion or retroflexion, especially the former. The treatment is rectification of the malposition. Chronic heart- and kidney-diseases also act as causes. But the most frequent of all causes is syphilis, and generally paternal syphilis. Treatment must be by inunction of mercury (Schmiercur). All other causes are extremely rare. If malformations exist,—as, for example, inability of the uterus to accommodate itself to the growth of the ovum,—then generally no conception occurs, or the woman gives birth prematurely to a dead child. But Schauta's article has been devoted to abortions occurring within twelve to sixteen weeks of conception.

THE TREATMENT OF MALARIA WITH METHYLENE BLUE, AND ITS LOCAL APPLICATION IN DIPHTHERIA.

Dr. A. Kasem-Beck (*Centralblatt für Klinische Medicin*, June 24, 1893) reports the use of methylene blue in thirty cases of malaria, when all other remedies failed or there was some reason why quinine could not be used.

The diagnosis was based on the physical condition of the patient; only in one case was the blood examined with the result of finding malaria parasites; in the other cases no such examination of the blood was made. The entirely characteristic course of the disease made the diagnosis clear even without such examination. The ages of patients ranged from two and a half years to forty years. Three of them suffered from febris intermittens larvata, indicated in one case by trigeminal neuralgia, in a second by severe headache recurring every day, and in the third by pains in the eye, which had been noted for five years. In the last case there occurred during the paroxysms changes in the sclera, cornea, and iris (iritis and keratitis parenchymotosa). In the course of 1892 the paroxysms of fever could still be successfully treated by quinine. In August of that year the malaria plasmodia were found in the blood. From November, 1892, on account of pain in the eyes, quinine could no longer be used. From March, 1893, the methylene blue was prescribed. One day later the pains in the eye ceased and it became perfectly normal. The paroxysms have been absent for a whole month. The methylene blue had just as favorable action on the two cases of latent intermittent fever: the use of it during two to three days was sufficient to cure the neuralgic pains.

In the remaining cases the intermittent fever was of various types. The duration varied from one year to three weeks, but was usually from three to six weeks, not counting short intervals free from paroxysms. In all these cases the fever paroxysms were quickly overcome by the use of the methylene blue. The dose was usually 1½ grains, with 3 grains pulv. nucis moschat.,

in capsules, four to five capsules daily, one every hour. Upon the cessation of the paroxysms the use of the methylene blue must be continued in smaller quantity, two capsules a day for from three to ten days.

There was only a recurrence of the malarial paroxysms in one case; it occurred after two months, and could not be cured by the methylene blue, but vanished under the use of Fowler's solution of arsenic in increasing doses.

Secondary symptoms were observed. Five times vomiting occurred after taking the methylene blue; three patients were women and two men. It should be noted that the vomiting did not occur after each dose; the first and second dose caused it, while the third and remaining ones caused neither vomiting nor nausea. Now and again the nausea and feeling of weakness caused dizziness. Most persons who took this remedy observed a frequent passage of urine, especially during the night, but the desire to urinate was not painful. In a few cases of strangury it could be accounted for by the fact that the patients had forgotten to take the muskat-nut powder at the same time, or that they had received large single doses,—4½ grains three times daily. In one case there was, indeed, a little blood found in the urine, but this disappeared three days after the discontinuance of the remedy. In spite of these symptoms, methylene blue is without dispute a good remedy for malaria, and may, as Kasem-Beck's observations show, be as certainly counted on as quinine. But large single doses must be avoided, and the whole treatment be conducted cautiously.

Kasem-Beck has also used the methylene blue to treat fourteen cases of diphtheria of the fauces, the soft palate, the pharynx, and in one case of the larynx, being in every instance well satisfied with the results of this treatment.

The methylene blue was used in a liquid (watery) solution (1 to 9), with which the diseased parts were saturated two or three times daily. In 1891, Beyer reported good results from the treating of fifty cases of pharyngeal diphtheria with a mixture of methylene blue and sugar powder. In order to permit the action of the sugar upon the diphtheritic process, Kasem-Beck ordered in each instance simply the watery solution of methylene blue. After moistening the diseased places with a plug of cotton, they were quickly saturated with the solution of methylene blue, which colored them dark blue; in order to let this have time to act, he never gives any gargle to follow it.

The temperature fell to normal in two to three days under such treatment, the œdema and the inflamed condition of the diseased places diminished from the first day, and the diphtheritic membrane began to disperse. The fact that the urine becomes blue or gray shows that some of the remedy is absorbed in the blood. Such a coloring is caused partly in that way and partly by the fact that some is swallowed during the painting. The methylene blue which finds its way into the blood is not without its influence upon the course of the diphtheria, especially when there is a general infection of the organism. So Kasem-Beck thinks that internal doses, such as are used for malaria, would also be valuable in such cases. He adds small doses of pilocarpine. The cases were all cured. Three times a paralysis of the pillars of the soft palate occurred; in one of these cases there was also a paretic condition of the lower extremities, especially in the thigh muscles. The latter complication disappeared, leaving no trace, in two and a half weeks.

SEROTHERAPY IN SMALL-POX.

B. AUCHÉ (*Archives Cliniques de Bordeaux*, July, 1893) details two cases of small-pox treated with hypodermic injections of serum obtained from the blood of patients who had previously suffered from the disease. The serum employed in the first case was obtained from a man, fifty-one years of age, of previous good health, free from syphilis, and who was admitted to the hospital a month and a half after he had suffered from a discrete form of small-pox. Once entirely recovered he submitted to being bled. After proper disinfection of the skin, about fifty grammes of blood were drawn, and on the following day from fifteen to sixteen cubic centimetres of serum were obtained from this blood. Six cubic centimetres of this serum were injected into the patient. The serum used in the second patient was obtained from a young man, twenty-five years of age, who had recovered from a slight discrete form of variola. From about one hundred grammes of blood drawn, from thirty-five to forty cubic centimetres of serum were obtained, of which eighteen cubic centimetres were injected into the patient. In the first case the injections were made on the tenth day of the eruptive period; on the second patient, at the beginning of the period of suppuration. The results were negative in both cases. The treatment produced no effect, favorable or unfavorable, on the evolution of the disease.

THE PHOSPHATES OF CALCIUM.

In a well-prepared article, P. CARLES (*Journal de Médecine de Bordeaux*) writes about the pharmacology and therapeutics of the calcium phosphates. The author concludes that no other except the *tribasic* phosphate of calcium ought to be employed in practical therapeutics. This phosphate is easily assimilated, and dissolved with the least difficulty by the juices of the stomach, notwithstanding the complexity of its chemical composition. This phosphate should always be prepared with calcined bone or, better still, with pulverized animal charcoal. When it is precipitated by soda in two hundred times or less its weight of water, this phosphate becomes so tenuous and light that it can be easily suspended in syrup. In this form it will indefinitely keep its original qualities. When the phosphate of calcium is to be used under other forms, pharmacists must not lose sight of the fact that the medicament undergoes changes through the influence of heat. The phosphated pastes of commerce ought not to be employed except with great caution.

THE EMPLOYMENT OF THROAT DOUCHES.

In a preliminary note, REVILLET (*Lyon Médical*, July 23, 1893) calls attention to the advantages of douches of the throat, by means of a caoutchouc tube, in such diseases as chronic atonic pharyngitis and dry chronic atrophic pharyngitis. He prefers this to all other measures, believing the method to be of superior advantage in the treatment of the affections mentioned. Pharyngeal irrigations with antiseptic solutions, the author affirms, tone up the mucous membrane, enhance its circulation and vitality, and remove from the surface of the pharynx the liquid and scabby matters which cover it, and at the same time modify and even destroy the infectious properties of these secretions. A future detailed report of the method here referred to is promised by the author.

THE TREATMENT OF TUBERCULOSIS IN CHILDREN.

In an exceedingly interesting article, CLEMENTE FERREIRA (*Bull. Générale de Thérapeutique*, July 30, 1893) gives his experience in the treatment of tuberculosis in children by various methods. With Koch's tuberculin his results were absolutely negative. The author afterwards tried the different antiseptic agents called by Germain Sée *necrophytic*. Ferreira employed successively *creosote* and *guaiacol* by the stomach and subcutaneously; *aristol*, *iodoform*, *cantharidate of potassium*, and *chloride of zinc*.

Treatment by Creosote.—1. By the Stomach.—In this manner the medicament was given in the form of pills, or in drops with milk to very young children. The dose was progressive until half a gramme a day was administered. No gastro-intestinal or urinary troubles were produced. Amelioration in both the local and general symptoms was marked, further evidenced by improvement in the powers of nutrition, accompanied by a gradual increase in bodily weight. Many patients were cured in from seven months to one year, especially among those who were subjected to the treatment at the very beginning of the disease.

2. *Hypodermically.*—The remedy was used in solutions in sterilized oil, sometimes associated with iodoform. The injections were made with all antiseptic precautions. The doses, gradually increased, were proportionately larger than those employed by the stomach, and yet no local or general untoward effects were produced. The injections were not used in very young children, except in special cases. On the whole, however, the results obtained by this method, though good also, were in many respects inferior to those observed in cases subjected to treatment by the stomach.

Treatment by Guaiacol.—1. By the Stomach.—The effects of guaiacol by the stomach were equally as good as those resulting from the administration of creosote. The drug was well borne, even in comparatively large doses. Children from one to two years of age tolerated easily mixtures containing 2.5 and 3 grammes of guaiacol dissolved in alcohol and associated with julep. No gastro-intestinal troubles or other toxic phenomena were produced. The drug was generally better borne by children than by adults. A case of tubercular disease occurring in a grown person is reported, in which 3 to 4 grammes in the course of twenty-four hours caused such gastro-intestinal disturbances, like colic and diarrhœa, that it was found necessary to suspend the medicament.

2. *Hypodermically.*—Guaiacol dissolved in sterilized oil was injected subcutaneously, in doses of 25 centigrammes, these being gradually increased until 3, 3.5, and 4 grammes were administered at once, and only three times a week. The little patients would receive, therefore, from 48 to 50 grammes of guaiacol each month. Notwithstanding the antiseptic precautions taken, this method caused in many cases an inflammatory reaction, painful nodules, and even abscesses at

the point of injection. This mode of administration, therefore, offered no advantages, and the author believes that it ought to be resorted to only in exceptional cases.

Treatment by Iodoform.—This drug was usually given by the stomach, in emulsion with julep, and in doses of from 15 to 25 centigrammes in the twenty-four hours. It was generally well borne. Iodoform was, indeed, often found of great service, but its use had to be prolonged, since many times an intolerance for it shown by the little patients interrupted the treatment. Improvement under the drug was slow.

Treatment by Cantharidate of Potassium.—Liebreich's method was employed in three cases. For hypodermic injections, a solution, of which eight drops represented one-quarter of a milligramme of the drug, was used. Injections of 3, 4, 5, 6, and 8 drops were made at a time, repeating the operation every six days. On the whole, the remedy did not produce bad after-effects. The kidneys tolerated the medicament remarkably well; no albumin was ever found in the urine, and there was no vesical tenesmus induced by the drug. No local reaction or formation of nodules followed the injection of the agent, though the operation was somewhat painful. In one of the cases improvement of the pulmonary phenomena was noticed, but not so in the general nutrition of the patient. In the second case, the good effects were shown in the respiratory function especially. Appetite was also improved, accompanied with an increase of bodily weight. Similar results were seen in the third case, but the little patient did not stay long enough in the hospital to make fuller observations.

Treatment by Chloride of Zinc.—The method promulgated by Lannelongue was tried in two little patients. One of these was suffering from tuberculosis of the submaxillary glands. Improvement was obtained under the treatment, so much so that in a short time there occurred an almost total disappearance of the disease. This returned, however, in about a month, and was then combated with creosote by the stomach, the use of this drug producing markedly good results. The disease appeared for the third time, and injections of chloride of zinc were resumed. Under this agent there resulted once more a prompt and remarkable reduction of the glandular tumors. In the second case, one of coxo-tuberculosis, injections of zinc chloride from a solution of the strength of 1 in 20 were made, according to the indications pointed out by Lannelongue. The method here, however, failed completely, and besides, it gave rise to the production of a large abscess, it becoming absolutely necessary to remove the pus by aspiration. This patient was afterwards treated with creosote, with satisfactory results.

THE LOCAL USE OF GUAIACOL.

Apropos of an article by Bard on the antithermic properties of guaiacol locally applied, and of which an abstract was published in the GAZETTE for August last, M. LANNOIS (*Lyon Médical*, August 6, 1893) published a contribution on the same subject, mainly corroborative of Bard's observations. Lannois, having tried the method in three patients, concludes:

1. Guaiacol locally applied diminishes to a considerable extent the abnormal temperature or tuberculous patients.

2. The absorption of the drug occurs most probably in the skin, and not by the passage of the guaiacol vapors through the lungs.

3. The absorption of the medicament by the mucous membrane of the rectum gives rise to the same reduction of the temperature as when the drug is applied to the skin; this same action has been observed also in the case of creosote.

THE TREATMENT OF CARDIAC DROPSIES BY THEOBROMINE.

G. SÉE (*Bull. de l'Académie de Médecine*, August 7, 1863) publishes an elaborate article on the above subject. The author, after detailing seven cases of dropsy of cardiac origin, concludes as follows: 1. Theobromine, like caffeine, belongs to that group of substances called *xanthines*, which have a great affinity for uric acid. Theobromine is a dimethylxanthine; it is the inferior homologue of caffeine, which is a trimethylxanthine. Notwithstanding their apparent analogy, their distinct physiological actions are determined by their methyl constitution. Both medicaments are diuretics, but the diuresis produced by theobromine is five times as abundant as that caused by caffeine. To produce such an effect the action is exercised on the secretory elements of the kidney, without any vaso-motor interference. 2. The action of theobromine in advanced cardiac dropsies manifests itself in an infallible manner. In the seven cases detailed, after other diuretics like digitalin, strophanthin, caffeine, etc., had failed, diuresis under theobromine was increased in from three to four days to two litres, and even six litres of urine; and *pari passu* with this increase in the amount of urine the dropsies decreased, since all the liquids were reabsorbed in an evident manner

proportionately to the polyuria produced. These effects were observed even when there was some albuminuria present; and there was not only an excess of the water eliminated, but also of the normal principles of the urine, among which may be mentioned urea. 3. The superiority of theobromine over other diuretics depends on the direct and absolutely inoffensive action of the drug upon the parenchyma of the kidneys. On the contrary, the other diuretics, such as digitalis, strophanthus, etc., act only by exciting the vessels and re-enforcing the heart. Caffeine, again, has the disadvantage of often producing cerebral excitement. Theobromine does not produce the least symptom of intoxication, although the nausea noticed sometimes does not in the least interfere with the genesis of the diuresis. 4. No matter what the cause of the cardiac dropsy, whether it be due to lesion of the aorta or of the mitral valve, or, again, to a degeneration of the heart-muscle, the effect of theobromine is the same. The medicament is prescribed to a patient in the horizontal posture, as follows: The first day, 2 grammes; the second day, 3 grammes in three pastilles of 1 gramme each, or in six pastilles of ½ gramme each; the third day, 4 grammes; the fourth day, 5 grammes. This mode of administration is followed by such an abundant diuresis and disappearance of the generalized œdema, as well as of the ascites, that tapping is dispensed with. When the dropsies are due to other than a cardiac cause, and are dependent on Bright's disease, then the effects of the drug are variable and doubtful. 5. The best mode of administering theobromine is in the form of pastilles or in capsules, since the drug is absolutely insoluble in water, alcohol, or ether. The substance which under the name of diuretin has been placed upon the market is nothing more than theobromine dissolved in salicylate of sodium, but the solubility of the combination can only be obtained by caustic soda in the strength of 4 to 100, and it is thus that diuretin becomes a dangerous substance. Theobromine is with difficulty absorbed probably in the intestines, but presents no inconveniences, and is in part eliminated by the urine, thus producing its curative action without causing bad after-effects. Besides, the ingestion of a large quantity of liquid is not required, and here again it has an advantage over *lactose*, an excellent diuretic, but excellent proportionately to the quantity of sugar of milk, which requires to dissolve this one litre of water for fifty grammes of lactose, and does not act except in amounts of one hundred grammes,—that is, with two litres of water. It may be said, then, that theobromine can be administered in a dry state, and must be accompanied by an ordinary but moderate diet. To maintain the effect produced, it is advised to prescribe, after a few days of repose, and during three days, ½ milligramme of digitalin, or 3 grammes of theobromine without any other adjuvant, unless it be the iodide of calcium, should there occur signs of oppression. With the observation of these rules, relapses of the disease can be prevented.

THE SERUM THERAPEUTICS OF CHOLERA.

Dr. A. Chernel (*Wiener Medizinische Blätter*, No. 24, 1893) gives an interesting account of the experiments conducted by Pawlowski and Buchstaf to determine the value of the blood-serum of immune animals in the treatment of cholera.

They believe the complex symptoms of cholera to be caused by the absorption into the system of peptotoxine which is produced by the common bacilli; hence the efforts of therapeutics must be directed to find a substance which will neutralize this poison which is circulating in the blood. They think they have found this remedy in the blood-serum of animals rendered immune against cholera.

Their work was in three divisions: First, they occupied themselves in rendering the animals to be experimented upon immune; then they studied the properties of their blood-serum; and, thirdly, they tried to render another series of animals immune with this or to treat them if already infected.

The process of rendering immune is as follows: They inject first weak cultures and then stronger ones into the chosen animals. In this case twenty guinea-pigs were selected and as many rabbits. The inoculation was in part through intraperitoneal or subcutaneous injection and partly by application through the stomach by means of a stomach-tube. The results were always favorable: the animals proved perfectly immune against cholera virus.

Doubtless the same course could be followed in rendering human beings immune; but, on account of the danger of infection during the treatment, a less dangerous way has been sought. They think this has been found in the use of the serum of immune animals.

To obtain such blood-serum in sufficiently large quantities, dogs are rendered immune. In these animals the first injection causes diarrhœa, loss of appetite, and general loss of flesh; but the following ones, even when very active cultures are used, are harmless. The blood-serum

of dogs thus treated has very valuable therapeutic properties. In order to study its action, Pawlowski and Buchstaf tried it in a test-tube, mixing this serum with cholera cultures. The bacilli found no favorable medium for development in it, and showed at the end of twenty-four hours the Bujwid reaction no longer, a proof that the poisonous peptotoxine was lacking.

The experiments were made with forty-five individuals. After an injection of 6 minims, or even much less, of the blood-serum of highly-immune animals, they are rendered refractory to the disease. The test animals would certainly have been killed when the poison was injected; but having had the injections first, they remained living. It appeared from the experiments that .55 cubic centimetre of the remedial serum would be sufficient to render a human being immune to the disease. Of sixteen dogs experimented upon, seventy-five per cent. survived. Two dogs having shown marked cholera symptoms, one was treated with the serum and survived, while the other died.

According to Pawlowski and Buchstaf, the actions of the serum are explained, not only as a struggle between bacilli and organism, but also as a purely mechanical action, the precipitation of the peptotoxine in the circulating albumin.

The absolute harmlessness of the blood-serum was proved by personal experiments, which were followed by no pathological reaction.

THE TREATMENT OF MYXŒDEMA BY THYROID-FEEDING: ITS ADVANTAGES AND RISKS.

PROFESSOR GRAINGER STEWART contributes to the July number of the London *Practitioner* an interesting lecture upon this subject, which deals, however, with that part of it already familiar to our readers. The point of particular interest which he emphasized was the danger of the cardiac depression produced by this thyroid treatment. After detailing a case which came under his notice, he goes on to emphasize the need of caution in this respect. He mentions the case of a gentleman whom he was treating along with an esteemed colleague with thyroid-feeding for Addison's disease, and in whose case a degree of general improvement had undoubtedly manifested itself. He has on several occasions had fainting fits since he began the treatment. On one occasion, for example, he went out to have a game of golf, and fainted when he had given his first drive. But almost all who have had experience in the treatment of cases have been impressed with this fact. Dr. George Murray, of Newcastle, to whose practical sagacity we are indebted for this brilliant addition to our therapeutic resources, has himself strenuously insisted upon this danger. He tells how two of his patients died from failure of the heart, the remedy having been administered to persons well advanced in years suffering from disease of arteries with cardiac degeneration. Dr. Lundie has also dwelt upon this risk, and urgently indicated the need of caution, while Dr. John Thomson has published the details of the fatal termination of a case well known to the profession from having been published in Dr. Byrom Bramwell's "Atlas of Clinical Medicine." After giving the details of the case and of its fatal termination, he finishes his paper in words which it is well to quote *in extenso*:

"While the state of the heart-muscle which was found in this case was amply sufficient to account for the fatal syncope, one can scarcely doubt that the thyroid treatment (or rather the imperfect application of it) may possibly have had some influence in hastening the end. The dose of the thyroid was certainly small (2¼ thyroids in three weeks), but still it had already demonstrated the activity of its action by the very marked effect it had produced on the subcutaneous swelling.

"The lesson which the case teaches is, not that we should refuse to treat patients with unsound hearts, but that our precautions in such cases should be more stringent. The dose should be much smaller than in more robust cases. The patient should be confined to bed from the beginning of the treatment, and means should be taken to insure that directions as to complete rest and the recumbent position are more strictly carried out than they unfortunately were in the case of my patient."

This recommendation Stewart most cordially endorses, and in continuing the treatment of the present case he intends giving the remedy in small doses (10 to 20 grains), giving it more frequently, and shall strictly enjoin rest and avoidance of excitement during the whole time, and give an alcoholic or other stimulant along with the dose of thyroid and on the succeeding days.

He also draws attention to the treatment which was employed in emergency. It was strictly on the lines on which he is accustomed to insist in cases of sudden cardiac failure. It consisted in the use of general and of cardiac stimulants,—alcohol, ammonia, ether, strophanthus, and digitalis,—of counter-irritants and derivatives, application of mustard,

and dry-cupping; but in his opinion the life was saved by the mechanical relief afforded by the bloodletting. Had not the acting resident physician performed phlebotomy the condition would most likely have proved fatal. It is to be hoped that the success achieved in this instance will encourage others in similar cases of heart-failure to resort to this remedy, which is now so little employed, but which undoubtedly is able at times to serve most important ends.

To accentuate this point has been the writer's main object; along with this he also mentions certain other by-effects of the thyroid treatment which must be kept in view. Among these are the occurrence of local abscesses, which has led most practitioners to abandon the hypodermic administration of the remedy; the nausea, vomiting, and diarrhœa, which have often given trouble, as well as the extreme debility, the unconsciousness, the convulsions, which have been described by members of the profession.

THE TREATMENT OF CHOREA BY LARGE DOSES OF QUININE.

It will be remembered that some months ago Dr. H. C. Wood published a paper in which he stated his belief that quinine would prove a valuable drug in the treatment of chorea, basing his opinion upon its physiological action. Following his advice, DORLAND and POTTS have used large doses of quinine in this disease. As a result of their studies in seventeen cases, they find that in a number of cases almost immediate improvement took place, which continued for a time, after which relapses occurred. This occurrence, it seems, may be due to the fact that the quinine merely acts as a stimulant, and, like all stimulants, loses its effect in time, to be followed by depression. Therefore, so far as any conclusion can be drawn from such a limited number of cases, it would seem that the best treatment for chorea would be the administration of large doses of quinine to lessen the severity of the movements, adding at the same time measures to build up and strengthen the depressed nervous system. This seems to be shown in Case IV., where final cure only took place after the administration of cod-liver oil and iron, and also in Case X., where cod-liver oil also had to be administered after a time. Another fact worthy of emphasis is the large doses that the majority of the children could take without any evidence of cinchonism. Finally, they do not claim that quinine is an absolute cure for chorea, and that from this time no such thing as failure in the treatment of such cases will be recorded. It should be borne in mind that after the chorea has been of long standing, and the loss of inhibitory power considerable or absolute, there must result organic changes in the motor cells of the cord, with the development of an atrophic condition. In such cases it is probable that failure will be the result of any form of medication, however rational. What is claimed is that in the acute form of chorea the results thus far obtained from the administration of quinine in large doses have been such as to warrant a further investigation as to the merits, immediate and ultimate, of this line of treatment.

THE CONDITION OF THE URINE IN RELATION TO ANÆSTHESIA.

PORTER, of New York, writes in the July number of the *Post-Graduate* quite a long paper upon this subject, and concludes:

1. That ether and chloroform act upon the same principles, but with results developed by slightly different methods.

2. That both are capable of producing death at the time of the anæsthesia; chloroform more frequently than ether.

3. That ether causes as many, if not more, deaths than chloroform, but the fatal issue is delayed until the patient has recovered from the operating-table.

4. That by a careful study of the density of the urine and its causes we are in possession of exact information by which we can determine the precise nutritive condition of the system and are forewarned as to the possible outcome of the anæsthesia. It also enables us to judge which anæsthetic is best adapted to the individual case in question.

5. We are taught that neither ether nor chloroform should be administered until the glandular organs, in their necessarily damaged state, are put in the best possible condition to endure this extra strain. When this is a general rule many cases that now prove fatal will be saved.

6. It teaches that every public institution should have a paid physician who is competent to examine the urine and determine through it the status of the physiological economy before giving the anæsthetic. It should also be the duty of this same physician to administer the anæsthetic, for he alone knows best which anæsthetic to select with a given condition of the system, and is also better able to guide the patient safely through the anæsthesia than one who knows nothing of the constitution of the patient except from a second part.

7. While it is clear that death in some instances is directly due to the primary effects of the ether and chloroform, and in others to the secondary effects, it should not deter us from using them, but stimulate us to be more thoroughly master of their actions upon the system and to guard against their ill effects. When all this is accomplished, chloroform will probably hold the first place as an anæsthetic.

THE VALUE OF THE COLD BATH IN THE FEVER OF PNEUMONIA OF CHILDREN.

In the *Post-Graduate* for July, 1893, FISCHER, of New York, has an article upon this subject, which he concludes by the assertion that it is always a good plan to administer a stimulant (good whiskey) before each bath, and this stimulation is not contraindicated though a child have delirium, the quantity depending on the condition of the heart, or, better, by watching the pulse, and also depending upon the age of the patient. The question as to whether stimulation is to be used hypodermically must be left to the judgment of the physician in each individual case.

To sum up the treatment he states the following:

1. That cold water is the best antipyretic used to-day.

2. That it is easily obtainable, and is therefore adapted to all classes of cases, both rich and poor.

3. The mode of application is so simple that it adapts itself to the hospital, and equally as well to private practice, and can be applied without any distinct training.

4. Cautiously given, it stimulates.

5. Carelessly used and longer than required, it depresses and will produce subnormal temperature.

6. That rectal temperature should be taken, and the bath at once discontinued when the temperature falls to 101° F., as it will then continue to fall.

7. That a stimulant administered before the bath may be necessary, and should be given where there is a feeble heart.

8. That the temperature indicates when to commence and when, also, to discontinue the hydropathic treatment.

9. Unnecessary blanketing after the bath is injurious and will produce copious perspiration which weakens the patient.

10. The temperature of the room should always be between 68° and 72° F.

THE PHARMACOLOGY OF THE NITRITES AND NITRATES.

Under this interesting title PROFESSOR LEECH has delivered the Croonian lectures for 1893 before the Royal College of Physicians, and the following summary, which forms a leading article in the *Lancet* for July 22, 1893, will prove of interest to our readers:

Although the first two Croonian lectures, which dealt with the pharmacology of the nitrites and nitrates, contained the results of a large amount of labor and of close experimental research, the third and fourth lectures are, we venture to think, more likely to be of value to busy practitioners, since they deal mainly with therapeutic considerations. While laying due stress upon the various conditions in which the nitrites and nitrates may be of service, Professor Leech does not hesitate to indicate clearly their limitations, even though he thinks that they are too often discarded through excess of caution. In their favor he points to the small quantities necessary to influence the vascular system, to the relative absence of risk unless employed with suicidal intent, and to the evanescent action. After referring to the broadness of the definition of angina pectoris adopted by Sir Richard Quain, he maintains that, according to clinical experience, this condition is always associated with a rise in tension due to temporarily-decreased caliber of either systemic or pulmonary vessels, and that the symptoms are the outcome of the heart proving unequal to the work it has to perform. The theory that the relief due to the administration of nitrites is the result of true analgesic action is not supported, the reduction of tension, as originally held by Dr. Lauder Brunton, being maintained as the true explanation. On account of their rapidity of action he prefers the nitrites of the fatty series, which can be employed by inhalation, but he considers that experience has shown that later attacks are of longer duration, and that although inhalations are beneficial in earlier attacks, they may frequently have to give place to remedies of more prolonged activity, such as nitroglycerin. Nitrite of amyl, as is well known, is not a stable compound, and it may on that account fail when it is given in solution, although a disappointing result may sometimes be due to the short duration of its period of action or to special insusceptibility of the individual. On the other hand, Professor Leech records many cases in which it has been found expedient to largely exceed the Pharmacopœial dose of the liquor trinitrini, and it is noteworthy that in his experience it is far safer to employ

somewhat large doses of nitro-glycerin than to resort to injections of morphine. Ethyl nitrate has scarcely been sufficiently employed in angina pectoris to warrant any very definite conclusions, but it appears to exert a more powerful and more persistent influence in reducing tension than that possessed by ethyl nitrite. Although the nitrates of propyl, isobutyl, and isoamyl are as effective as the nitrite of ethyl in lowering tension, they cause so much headache that they have not been employed medicinally. It must not be forgotten that the influence of nitrites and nitrates upon angina pectoris is palliative rather than curative, and that they should therefore be used concurrently with such remedies as iodide of potassium and arsenic.

Paroxysmal cardiac dyspnœa may be relieved by the action of the nitrites on the pulmonary system of vessels as well as on the systemic system, but the ordinary shortness of breath consequent on exertion, which is so frequently met with in simple valvular lesions of the heart, seems to be unaffected by them. On the other hand, Professor Leech is convinced that some good and no harm has resulted from the use of nitrites in cardiac failure or in syncope such as that occurring during the administration of chloroform. Of the value of this group in asthma and bronchitis there can be no doubt, but the rationale is not easy to explain. It is possible that asthma is not the result of simple bronchial spasm, but that there may also be, as has been suggested by Sir Andrew Clark, some hyperæmia or tumidity of the bronchial mucous membrane, and that the influence on the pulmonary vessels may also relieve the bronchial vessels. Whatever explanation is adopted, testimony is largely in favor of using nitrites in many of those cases which are ordinarily treated with ammonium carbonate and ether. In uræmic dyspnœa and in migraine the results are disappointing, but the converse holds good for the treatment of forms of headache associated with high tension. The value of the series in tetanus, strychnine-poisoning, and epilepsy is open to considerable doubt, notwithstanding the favorable statements which have previously been made. In the treatment of acute Bright's disease there is also great lack of certainty of the efficacy of the nitrites, although diuresis has appeared to be hastened by the administration of nitro-glycerin or sodium nitrite, headache and other discomforts have been relieved by them, and they certainly have the advantage of causing no ill effects. Similar difficulties attend the estimation of the results in cases of large white kidney and in mixed forms of chronic nephritis, but in dyspnœa and cardiac failure of late stages of contracted kidney nitro-glycerin adds to comfort and perhaps tends to prolong life.

Among other practical points may be noted the remarks upon the official compounds. On account of the decomposition of nitro-glycerin in presence of any salt, it is better to employ the tabellæ or else a simple dilution of the liquor trinitrini with distilled water. For subcutaneous injection, in the rare cases where inhalation of amyl nitrite fails, nitro-glycerin is better than sodium nitrite. The benefits of spiritus etheris nitrosi have depended upon the proper proportion of nitrite of ethyl, and lack of appreciation of this fact appears to be largely the result of the rapid decomposition which occurs on mixture with water; hence the valuable recommendation that the dilution should be effected only at the time when this drug is required. It is curious, however, to learn that this decomposition is retarded or prevented when solutions of acetate or citrate of ammonium are mixed with the spirit of nitrous ether. This combination has so long found favor with practitioners that it is comforting to know that their faith was grounded, even though unconsciously, upon sound scientific foundations.

In the concluding portions of the last lecture Professor Leech examined the pharmacology of certain groups allied to the nitrites, such as the nitro-group, the nitrosamines, the hyponitrites, and the oximes; but his remarks and experiments upon these points have far greater interest for the pharmacologist than for the bulk of the profession. Some of these groups are too nauseous for therapeutic work and others have exhibited marked toxic properties, and upon the whole we feel that they have been investigated rather with a view to throw light upon the method of action of older and simpler compounds than for the sake of perhaps adding to the list of new remedies. On these grounds, therefore, we refrain from summarizing the results obtained by Professor Leech, and content ourselves with noting that he has found that the nitro-compounds of the fatty series—nitro-methane, nitro-ethane, etc.—lower tension for a long time, although not very markedly. From all that has been said it will be gathered that in these lectures Professor Leech has presented a very ample vindication of the value of pharmacological research. Experiments upon the behavior of the different groups upon muscles have afforded indications which have not only encouraged or discouraged therapeutic investigations, but have also given rise to very numerous practical observations upon

the proper methods of prescribing and employing either the nitrites or their allied compounds.

THE TREATMENT OF PERICARDITIS.

In the *Lancet* for July 22, 1893, LEES publishes an interesting article upon this subject, in which, after speaking of the dilatation of the heart which he thinks occurs in pericarditis, and after considering the dyspnœa, he goes on to say that if these statements are true the proper treatment of pericarditis must be a matter of vital importance to the patient. It is clearly a condition which calls for prompt and energetic treatment, if only it can be satisfactorily determined of what nature that treatment should be. Fifty years ago there was neither doubt nor hesitation in the matter, and the treatment adopted was certainly not lacking in vigor. In his "Lectures on Diseases of the Heart," published in 1845, Dr. Latham describes his treatment of eighteen cases of pericarditis. He says, "Not a moment was lost in the application of remedies. They were venesection and cupping and leeches and blisters and opium and, from first to last, mercury." And he especially insists that it is necessary to push mercury to salivation. How many of these formidable measures are in use to-day? Venesection, cupping, and mercury have been absolutely banished from the treatment of pericarditis. Three or four leeches, or a single small blister, now represent the maximum therapeutic attack on the disease from without, while a little morphine alone remains as a representative of the active medication of former days,—that is to say, we have given up the idea of curing pericarditis, and limit our efforts to keeping the patient at perfect rest, nursing him assiduously, and trying to ease his pain by morphine and by the soothing influence of warmth to the præcordium. We have, indeed, discovered that salicylates are curative of the rheumatic process on which the pericarditis usually depends, but it is taught by some physicians that this drug must be given up on the occurrence of pericarditis, lest it should cause cardiac depression. Thus it may be said that the treatment of this formidable complication of rheumatism is rather less than nothing, for the patient is actually deprived of the sole remedy which seems to have a specific influence over his rheumatism. Have we, then, no means of combating pericarditis as a local inflammation? I maintain that we have. It is the local, persistent application of cold. This should be first tested by watching the therapeutic effect of persistent cold on a local inflammation in another part of the body,—on the neuritis of the sciatic nerve, otherwise called sciatica. If, in a case of this disease which is of not more than two or three weeks' duration, two ice-bags are placed over the course of the inflamed nerve, and are kept applied for two or three days, there is usually rapid and marked improvement, the pain and tenderness quickly diminishing. Encouraged by the result of this experiment, the effect of the application of an ice-bag over the tender region in the right groin in a mild case of perityphlitis should be tried next. The severe cases due to perforation of the appendix vermiformis are excluded by a concretion, for these are unsuitable for palliative treatment; they are only too apt to kill rapidly by general peritonitis, and require early operation. The writer has had six cases of this kind; five of them were saved by prompt interference; the first was not operated on and died in a few days. But if, in a case of perityphlitis in which there is a tense tender swelling in the appendix region, but in which the diaphragm still descends in deep inspirations and where there is no evidence of general peritonitis, an ice-bag is applied over the swollen appendix, the greatness of the relief which results within twenty-four hours is surprising. This has been noted many times. A recent observation in this impressed the author greatly. It was the case of a young man in whom severe symptoms of perityphlitis had already been present for ten days when first seen. There was marked distention of the abdomen, which was extremely tender over nearly its whole extent; the diaphragm was passive, and the expression of the face was such as to give the impression that he had not many hours to live. It was necessary to postpone operation for a short time, to obtain the consent of his relatives, and meanwhile an ice-bag was applied to the right iliac fossa. When visited again several hours later, with a view to immediate operation, astonishing improvement had taken place. He had lost all pain, the abdomen was much less tender, and the expression of his face was altogether different. The effect was so striking that for a short time there was hesitancy as to need for operation; but as it was practically certain that there was pus in the peritoneum, operation was decided upon, and an incision let out a considerable quantity of pus from the peritoneal cavity. Very great relief followed, and the subsequent progress has been satisfactory. Here was a case of perityphlitis of the worst kind, in imminent danger of death, and yet

the local application of ice was able to produce the most marked alleviation of the symptoms.

These two illustrations are enough to demonstrate the possibility of actively repressing visceral inflammations by the local use of ice, not to speak of the local effect in pneumonia, though there is positive proof of this, because here the local result is not so obvious: it requires careful daily watching of the physical signs. It is therefore probable that the application of ice will tend to check inflammation in the pericardium also; but a further question now arises. Is ice a safe application to the region of the heart? The heart inflamed with pericarditis is already much depressed; is there not a risk of depressing it still further by the use of ice, perhaps of bringing it altogether to a stand-still? If the heart of a recently-killed frog, which is still pulsating normally, be chilled by ice, it soon ceases to beat; if, then, the ice be removed and warmth be substituted, pulsation returns; this alternation can be repeated two or three times. In this experiment it is clear that the cold acts as a powerful cardiac depressant; but it does not necessarily follow that the application of ice over an inflamed pericardium will add to the cardiac depression. If it succeeds in checking the local inflammation it may even lessen the depression and actually become a tonic to the heart. Which of these two results will follow can only be determined by cautious employment of the ice-bag and careful observation of the result. The notes of seven cases treated in this manner, already published by the writer, give evidence that the ice-bag, when used with reasonable caution, is a safe application in pericarditis, that it is usually liked by the patient, that it tends to check the violence of the local inflammation and to hinder effusion, and that it may even help to cause absorption of effusion which is already present. It acts *cito, tuto, et jucunde.* Since the publication of these cases he has continued the use of the ice-bag in the treatment of pericarditis, and with very satisfactory results. In the subacute carditis of rheumatic children, often attended with some friction-sound and signs of cardiac dilatation, but with little pyrexia and few symptoms, each attack, however, leaving the heart more damaged than before, he finds that ice is of doubtful benefit and is apt to depress; but the acuter cases, even in children, derive great benefit from its use.

The question of the continuance or discontinuance of salicylates during an attack of pericarditis is of great interest. Some physicians of large clinical experience have advised the omission of these drugs when pericarditis occurs, believing that they cause increased cardiac depression. Is this a fact or not? Lees has been carefully on the lookout for evidence of cardiac depression produced by salicylates, and has never been able to satisfy himself as to its occurrence. On two occasions he noticed a slight irregularity of the pulse apparently produced by salicylates, but he never observed any marked enfeeblement apparently caused by them. It is hardly likely that the cardiac depression produced by the pericarditis itself can by skilled observers have been been credited to the salicylates taken, and it is more probable the effect may have been brought about by some impurity of these drugs in days when an enormous demand for them suddenly arose and the methods of manufacture were not so perfect as at present. In a condition essentially rheumatic it seems a pity to give up the use of salicylates unless there is clear evidence of their hurtfulness. The author has been in the habit of continuing their employment in his cases of pericarditis treated with ice, and has been well satisfied with the result.

A little morphine subcutaneously injected is often of much service, and the application of a few leeches to the præcordium at the commencement of the pericarditis decidedly gives relief. He has only once had recourse to venesection; it was in the case of a young man with very severe pericarditis, in whom there was extreme cardiac dilatation. It was employed with a view of giving some relief to the right side of the heart, and it seemed to be quite successful, the patient recovering from what was certainly a very critical condition. An ice-bag also was kept over his heart for several days, and gave him so much comfort, that when it was removed he requested that it might be reapplied. On more than one occasion during his gradual improvement he experienced pain over the cardiac region, and at his own request the ice was again employed; on each occasion it gave relief. In many other cases in which the ice-bag has been used—in pericarditis, in pleurisy, in pneumonia, in perityphlitis, and in sciatica—patients ask for its reapplication, a fact which may be looked upon as a clear indication of the benefit which they were conscious of having received from it.

QUININE BLINDNESS.

In the *Medical News* of July 29, 1893, PISCHL contributes an article upon quinine blindness, in which he details a case in which he believes the amblyopia to have been due

entirely to quinine, although the man had been a drinker. He then goes over the literature of the subject, quoting Atkinson's well-known paper and De Schweinitz's researches upon the results on the optic nerve of the administration of toxic doses of quinine.

HEARING RESTORED BY LARGE DOSES OF QUININE.

In the *Medical News* of July 29, 1893, TRIPLETT records the case of a man, sixty-two years of age, very robust, always had very good health. About eight years ago he noticed that the hearing in his right ear was steadily growing less acute, until he finally became absolutely deaf in that ear, the hearing in the left ear remaining normal.

Shortly after the deafness developed both lenses of the eyes became cataractous, the left maturing before the right. Two years ago, in September, the left lens was extracted. All went well until he "caught cold" in the aphakic eye, when severe ophthalmitis set in. The pain was so severe that the opiate directed by his physician did not allay it. He told his physician to prescribe for him all the quinine he could stand. The quinine was put into large capsules, and he was directed to take one capsule every four hours, but instead of taking one, he took three capsules every four hours. Cinchonism followed, and a "burning sensation" in the extremities, especially the lower, was experienced. The ocular inflammation subsided, but with loss of vision. With the subsidence of the inflammation hearing returned, and has been normal ever since. There was no discharge from either ear, nor was there tinnitus aurium in either. No cause could be assigned for the deafness. The man had never been troubled with catarrh of the naso-pharynx.

In the following March the remaining cataractous lens was extracted. No complications arose, and the man now has good vision in the eye.

It seems that in this case quinine simply reversed its usual *modus operandi*. It is probable there is no practitioner who has not seen deafness of varying degrees, temporary or permanent, caused by large doses of quinine.

It is known that quinine produces congestion of the peripheral sense-organs, and it is probable that the auditory organs were in such a peculiar condition that congestion brought about this happy result.

It is also likely that, unnoticed, a slight discharge may have escaped during the height of the congestion. The quantity of quinine taken is not known.

MASSAGE IN MUSCULAR RHEUMATISM, AND ITS VALUE IN THE DIAGNOSIS OF MUSCULAR RHEUMATISM IN NEURITIS.

DOUGLAS GRAHAM contributes to the *American Journal of the Medical Sciences* for August, 1893, an article upon this subject, in which he adduces evidence which to him is sufficient to show that massage is a valuable means of making a differential diagnosis between muscular rheumatism and neuritis. The patients who are suffering from muscular rheumatism rapidly recover under the employment of rubbing and the administration of suitable drugs, while those who are suffering from neuritis do not obtain so much benefit. At the same time he points out that in these cases of neuritis, particularly of the sciatic-nerve character, improvement also follows the employment of massage.

TREATMENT OF TRUE CROUP BY THE "BROOKLYN METHOD."

In the *Brooklyn Medical Journal* for August, 1893, DR. MADDREN has an article upon "The Treatment of True Croup" according to what he calls the "Brooklyn method." He states that the treatment of pseudo-membranous laryngitis by the sublimation of calomel was originated and used by his friend, Dr. Corbin, in 1874. The doctor's idea was that of the destruction of the products of inflammation in the windpipe by subliming a mercurial and compelling the patient to inhale it by loading the air to be respired with the sublimed material. The better and quicker to accomplish this, and to protect those in attendance from the harmful effects, he caused the patients to be covered by a temporary tent made of sheets, blankets, or other available articles. The black oxide of mercury was the material used in the first sublimation; afterwards the doctor substituted calomel, and had a special alcohol-lamp made for subliming it.

This treatment, while calling for care and thoroughness, does not, like tracheotomy or intubation, require special skill in the operator, and it has the advantage of being available for immediate and repeated application by those in attendance in the absence of the physician.

The sublimation of calomel should be begun early, as soon as a diagnosis of true croup can be made, or before, if there is a strong sus-

picion of a membrane forming in the windpipe, as evidenced by a peculiar, dry, barking cough, disturbance and difficulty of respiration, etc. There is much advantage in beginning treatment thus early, as the object should be not only to relieve dyspnœa, but to arrest the formation and extension of the pseudo-membrane and to prevent or lessen systemic poisoning.

Preparatory to treatment by sublimation, a dose of calomel of two or more grains, according to age, administered early in the course of a laryngeal inflammation, has a very good effect, and I believe should be generally employed unless there are special contraindications.

The patient should be placed in a large, well-ventilated apartment, in which a temperature of about 80° F. can be maintained, and the air of the room kept well moistened by steam obtained by boiling water, or slaking lime, or from steam-pipes. Dr. Corbin adds carbolic acid to the water being evaporated. Perhaps still better is the combination recommended and used by Dr. J. Lewis Smith in diphtheria and scarlet fever. For several years Maddren has used it with satisfaction.

It consists of—

℞ Acidi carbolici,
Ol. eucalypti, of each, ℥i;
Spts. terebinth., ℥viii.

"Add two tablespoonfuls to one quart of water, in a tin or zinc wash-basin or pan of broad surface, and maintain a constant state of ebullition or simmering in the room occupied by the patient." Observations in regard to the use of this vapor indicate it to be an efficient germicide.

The apparatus consists of a tent and an alcohol-lamp. For the tent, the child's crib or cot may be used. The uprights at the ends may be formed of bed-slats, broom-handles, or plastering-laths fastened to the head and foot or corners of the crib or cot, with a broom-handle, slat, or stout cord to form a ridge-pole. The top of the tent should be a foot or more above the child's head, when sitting up in the crib. The covering of the tent may be two or more stout sheets or light blankets, applied so that they will cover both ends and overlap at the centre. This will permit the parent or nurse to hold the little patient's hand without uncovering or letting out the vapor, and to reassure and watch the child if necessary. Sometimes it may be desirable to have the patient remain in the vapor under the tent for some little time after the sublimation has been finished; generally there is much relief of symptoms and distress, and occasionally the worn-out little one will fall asleep. The tent may be opened by folding back the sheets or covering from the centre, but if this be done too soon the moisture in the air of the apartment will quickly precipitate the particles of calomel suspended in the air of the tent.

To keep the air in the tent as pure as possible, it is desirable to consume but little time in the burning of each powder. This also avoids raising the temperature in the tent to too high a point and charging the air with an unnecessary amount of carbonic acid gas.

The alcohol-lamp may be such a one as Dr. Corbin has had constructed and has used for most of his cases. As the use of a previously-used sublimating-lamp and outfit may be a possible means of conveying germs to others, it is safest to use a new outfit for each case. This may be easily and cheaply constructed by procuring a small alcohol cooking-lamp with tripod, fastening it with three or four tacks to half a crib-slat; the tin cover of a blacking-box or piece of sheet-iron (the thinner the better to favor rapid sublimation) to fasten to the top of the tripod and over the top of the lamp. There should be a concavity or slight indentation at the centre of the tin cover to prevent the calomel from scattering or rolling off when heated, and the edge of the sheet-tin or iron may be turned down, the better to restrain the flame of the lamp.

The quantity of calomel used in each sublimation should be from 30 to 60 grains; the sublimation to be completed in as short a time as possible. The intervals of treatment vary. When the breathing is specially labored and difficult, the burning of the calomel may be required, for a short period, half-hourly; but usually the treatment is repeated every two or three hours, increasing the intervals as the period of relief extends. In my experience the whole quantity of calomel used upon a case has been from one-half to several—and in one case that recovered eight—ounces.

As an auxiliary, turpeth mineral, in 1- or 2-grain doses, one, two, or three times in the twenty-four hours, especially when the character of the cough suggests a partial loosening of the pseudo-membrane, with the view of aiding or hastening its separation and expulsion.

When possible, oxygen should be available for immediate administration; it will often be of service, and may occasionally save a life.

Special attention should be given to sustaining the strength of the patient by nourishment

and stimulants, particularly following each sublimation.

Maddren believes, with Dr. Law, that "while mercurial fumigation will not take the place of surgical means, no physician is justified in performing intubation or tracheotomy in pseudo-membranous laryngitis until fumigation has been tried, nor, that failing, is he justified in allowing a patient to die without surgical attention."

After intubation or tracheotomy, when there is evidence or reason to suspect the formation of a false membrane below the tube, the sublimation of calomel should be employed or continued. Reports received state that this has been done in a number of cases. Dr. Landmann, of New York, makes this course a routine practice.

From the nearly 400 inquiries sent out, replies were received from 242 physicians, which are tabulated in full in the annexed table. Of these, 65 physicians belonging to Brooklyn, with 11 from New York City and elsewhere, have furnished reports of 505 cases of true croup treated by the sublimation of calomel. Of these, 275, or about 54.5 per cent., recovered; 85 of the 505 were tracheotomized or intubated after having been unsuccessfully treated by the sublimation method. Of these, 29 recovered. If we deduct these 29 recoveries after intubation or tracheotomy from the whole number of recoveries after sublimation (275), we have 48.7 per cent. of recoveries from the sublimation method alone. It is worthy of note that in these statistics the percentage of recoveries in those cases first treated by the sublimation method and then either intubated or tracheotomized is greater (34.1 per cent.) than those treated by either tracheotomy (24.2 per cent.) or intubation (30.5 per cent.) without the sublimation treatment.

A RATIONAL OPERATION FOR ENTROPION FOLLOWING GRANULATIONS.

MASSELON (*Annales d' Oculistique;* July, 1893) recommends the following operation: After applying a large palpebral forceps (Snellen or Knapp), make an incision in the skin extending the entire width of the eyelid and from two to three millimetres from the palpebral edge and parallel to it. Then dissect the skin and separate it from the underlying tissues below as far as the palpebral edge and above as far as the upper part of the tarsus. With forceps and scissors remove the orbicular fibres situated in front of the tarsus, so as to lay it entirely bare. Then remove the palpebral forceps and seize the tarsus with the thumb and first finger of the left hand, slipping the forefinger under the eyelid. The alterations and deformities of the tarsus can thus be determined accurately. Then proceed to remove or destroy all of the protuberant parts of the tarsus, so as to leave it just thick enough to permit perfect flexibility. This, the most important stage of the operation, is not without difficulty. The tarsus can be readily pared down with the blade of a bistoury, which is to be used flatwise and with a sawing motion. Curved scissors may be needed to detach the portions of the tarsus which were not perfectly severed. The thermocautery, although its blunt edge is less convenient, sometimes accomplishes the work of levelling the tarsus and reducing its thickness more promptly.

Three vertical sutures made on the tarsus alone must then be distributed over this tissue, as follows: Pass the needle through a narrow but solid layer of tarsus tissue, successively above and below the tarsus. This can be done correctly only by holding the forefinger of the left hand under the eyelid, so as to make sure that the needle enters to a certain depth, raising the internal surface of the tarsus. One silk thread is thus drawn through perpendicularly to the middle part of the tarsus and two on its sides. The sutures are then drawn firmly together and fastened with a double knot. Their tendency is to turn the tarsus in the opposite direction to its normal curvature. The ends of the sutures must not be cut near the knot, but brought together near the front and fastened with a strip of court-plaster above the eyebrow. These threads, being attached above, tend to bring the upper lip of the cutaneous wound against the tarsus; the former, of its own accord, rests against points where the sutures have been fastened and from where they are deflected in an upward direction. As to the lower edge of the wound, it naturally takes its place below the sutures, owing to the slight elevation of the small section of the skin adherent to the palpebral edge. In this way it is unnecessary to make any cutaneous suture whatever.

The bandage is to be worn forty-eight hours, at the end of which time the cutaneous wound will have closed. The sutures are then cut a slight distance from the knot, so as to allow a few millimetres of the thread to pass into the wound. These drop off of their own accord in a few days, or they must be detached if they fail to sever the tarsus tissue.

The marked advances made in therapeutics

in later years by the use of jequirity, brossage, scarification, and antiseptics in the treatment of trachoma, lead Masselon to hope that an operation for entropion, safe and lasting in its results, will tend to increase the number of cures, and to some extent reduce the number of unfortunate victims of this distressing malady.

THE TREATMENT OF ULCERS AND ABSCESSES OF THE CORNEA BY CURETTING AND IRRIGATION.

WECKER (*Annales d' Oculistique*, July, 1893) for some time has treated ulcers and abscesses of the cornea by means of curetting and antiseptic irrigation. He claims the most astonishing results, the most important of which are: (1) the instant suppression of the pain and the photophobia; (2) clearing up of the surrounding parts, followed by a more rapid cure than is obtained by the use of various antiseptics, and particularly by the actual cautery; (3) restoration with a more transparent tissue than by any other treatment. The ulcers and abscesses are operated on with a small curette differing very little from the model of Critchett, except that it is one-third as wide and has sharp edges. He endeavors as much as possible to remove from the base and edges of the ulcer the sloughing material adherent to it, the operation being done under a spray of a four-per-cent. solution of boric acid.

ON THE VALUE OF FORMIC ALDEHYDE AS AN OCULAR ANTISEPTIC.

M. VALUDE (*Revue Générale d' Ophthalmologie*, July, 1893) believes that in the estimation of the respective values of different antiseptics the mistake is made of trying to compare substances whose action on micro-organisms is absolutely different. Thus, sublimate, which as a microbicide is endowed with a power superior to any other known antiseptic [this statement is not correct.—ED.], must nevertheless yield to aniline substances under certain circumstances, when special tissues impregnated with pathogenic microbes are to be thoroughly permeated. This means, not that the aniline substances are more antiseptic than sublimate, but only that in the cases where diffusibility is required their action is superior.

With Dr. Dubief, Valude studied a substance possessed of a very interesting aseptic quality,—namely, formic aldehyde. Formic aldehyde appears in the form of a colorless liquid in the pure state, which, when dissolved in water, with which it is very miscible, has only a very slightly empyreumatic odor. Formic aldehyde is very greedy of water, consequently very diffusible. Another advantage is that it does not coagulate albumin, nor is it poisonous, or only slightly so, since a certain quantity of it may be drunk with impunity. Other than this, it resists the action of light, even in a bottle insecurely corked.

The aseptic properties of this substance are exceedingly remarkable. They have been studied by Duclos with the very small dose of .016 milligramme to the litre. He prevented the development of microbes in meat-broth, and, with the vapor produced by allowing the open bottle to remain under a receiver, he succeeded in preventing a piece of meat from decaying through a period of several weeks. The actions of sublimate and formic aldehyde differ; advantages may be derived from the special properties of each. Sublimate is an immediate antiseptic, but one whose effect ceases as quickly, for it is well known that conjunctivas washed with sublimate betray micro-organisms on the next day. From this point of view, different results might be obtained from formic aldehyde, which insures prolonged sterilization. In the cases of patients destined for operation, Valude has performed disinfection with sublimate (1 to 2000) on one of the eyes, and on the other with formic aldehyde in the same dose. The conjunctivas washed with aldehyde were sterile fourteen times out of sixteen, while with sublimate the same fact was noted in only half the cases. As it is very difficult to determine, in such ocular infections as purulent conjunctivitis or post-operative infection, whether the treatment used acted by killing existing microbes or by preventing the development of new infections, he desired to experiment with formic aldehyde, which possesses the latter property to a high degree. In chronic conjunctivitis, where pus is constantly reproduced,—pus, moreover, which resists every treatment,—he has obtained the best results with repeated instillations of formic aldehyde, and with the same instillations he has also been able two or three times to arrest post-operative infections which were in a fair way to cause panophthalmitis. He considers it a valuable agent in such cases, and has used it with equal success in the ophthalmia of new-born infants.

There is one result which may be gained by this powerful aseptic, which is the prolonged sterilization of collyria, which do not precipitate with formic aldehyde as with sublimate; in fact, particles of atropine and eserine remained un-

changed for more than a month. The simple sterilization of collyria is, therefore, according to the reporter, a solved question, and in order to assure it it is only necessary to use aldehyde in the dose of 1 to 2000. Finally, formic aldehyde has no influence upon the metals, and therefore is a good liquid for an instrumental bath. It does not irritate the eye, but causes only a passing smarting, which is increased by strong doses, but unimportant with solutions of 1 to 2000.

CONCERNING OCULAR SYPHILIS AND ITS DIFFERENT METHODS OF TREATMENT.

M. CHIBRET (*Revue Générale d' Ophthalmologie*, July, 1893) thinks that the best general treatment for ocular syphilis consists in the hypodermic injections of soluble salts, particularly the cyanuret of mercury. The best method of local treatment varies according to the seat of the syphilis. Syphilis of the cornea and of the choroid are favorably affected by subconjunctival injections of soluble salts, whereas syphilis of the iris is insensible to this treatment. The combination of local and general treatment for corneal syphilis has produced more successful results than have hitherto been obtained by any other method. The unpleasant results by injections of soluble salts are, in the first place, a slight local pain, then diarrhœa, indicating acute poisoning, which is easily avoided and checked by the prudent administration of suitable remedies. The advantages of this method consist in the rapidity and intensity of the therapeutic action, as well as in the accuracy of the doses. The common unfavorable results from other medications are particularly symptoms of chronic poisoning, such as salivation, anæmia, and symptoms which readily result from intense or prolonged treatments. Iodide of potassium is of no specific value for syphilis. It facilitates elimination of mercury and is effective in combating poisoning. As an adjuvant to mercurial treatment, it diminishes its specific effects. While it might possibly be expedient to combine or to alternate iodide with mercurial medications which incur the risk of chronic poisoning, it is certainly useless, in the belief of Chibret, to administer it conjointly with injections of soluble salts.

Trousseau believes that the treatment by inunction would always be the most successful if the rubbings were well done, which is rarely the case. Comparative results of treatments by subconjunctival injections and by careful rubbings are the same. The advantage is, therefore, with frictions, because they are more manageable. His own experience is that parenchymatous keratitis yields best to inunction, if it is carefully done from the beginning.

M. Panas, stating that he is the first in France to recommend the use of mercurial inunctions, believes it is his right to speak in their favor. He desires to say, however, that subcutaneous injections of mercurial salts (biniodide of mercury dissolved in sterilized oil) are greatly superior. He considers iodide of potassium preferable to mercury in the treatment of interstitial keratitis.

Parisotti protests against the strictures concerning the injections of calomel. He has long used them in his practice, always employing antiseptic precautions, because the substance itself is not antiseptic.

Sulzer agrees with Parisotti that local accidents may be avoided in the injections of calomel. The great danger of these injections consists in the fact that a possible mercurial intoxication of the most intense form might be maintained from the immovable deposit of mercury which has been placed in the organism.

Galezowski insists upon the fact that exploration of the ciliary region with the ophthalmoscope in interstitial keratitis demonstrates choroidal lesions which are the evident symptoms of syphilis, and recommends mercurial inunctions continued for two years.

Gillet de Grandmont prefers injections of soluble salts to inunctions.

Chibret, in closing, declares that the advantage of cyanuret of mercury over other mercurial salts consists in the fact that the former does not cause albumin to coagulate, and, when passing off, remains soluble in the tissues. Sublimate and biniodide, which coagulate albumin, are then transformed into soluble salts.

TREATMENT OF AFFECTIONS OF THE LACHRYMAL CANALS BY CONSERVATIVE AND ANTISEPTIC METHODS. A NEW PROCESS OF LACHRYMOTOMY.

BOURGEOIS (*Revue Générale d' Ophthalmologie*, July, 1893) argues that the natural form of the lachrymal canal should be preserved. Removal by constriction, formerly so frequently practised, should be exceptional. The basis of treatment is injections, or spraying of antiseptic solutions, such as boro-borax and sublimate. These sprayings are made by means of a hollow probe passed through the inferior canaliculus. If the latter is contracted, especially

at the point of junction with the sac, there is occasion to perform lachrymotomy. This operation may be compared to internal urethrotomy, and is accomplished with a small knife about half as long as the Weber knife. After the inferior canaliculus has been dilated by means of a conical sound, the knife is thrust inward, blade downward, as far as the bony wall of the sac, and then withdrawn in the same manner. Through the canaliculus thus enlarged, but preserving its tubular form, hollow probes are passed, by means of which the spraying is performed. If these sprayings are repeated several days in succession, the contraction does not return and the epiphora disappears. Recent dacryocystitis, it is said, is also rapidly cured in this way.

CONCERNING ANTISEPSIS OF THE CONJUNCTIVAL SAC AND THE ANTIBACTERIAL PROPERTIES OF TEARS,

AND

EXPERIMENTAL RESEARCHES IN ANTISEPSIS IN OPERATING FOR CATARACT, MADE AT THE OPHTHALMIC CLINIC IN ZURICH.

Under the above titles a lengthy abstract of two theses appears in the *Annales d' Oculistique*, July, 1893. The first is by J. Bernheim (Thèse de Zurich, 1893), and the second by Hildebrandt (Thèse de Fribourg-en-Brisgau, 1893). The following is HALTENHOFF's review of these two brochures:

These works, inspired by Professor Haab, supplement each other, being based on the same methods of research,—namely, repeated inoculations on various cultivating mediums made with a platinum needle after its contact with the conjunctiva, or the palpebral edge, either before or after the various processes of ocular antisepsis, such as cleansing and washing with sublimate (1 to 5000 to 1 to 1000), painting with chlorine water, with nitrate of silver (1 to 2 to 100), with trichloride of iodine (1 to 1000 and 1 to 2000), dusting with powdered iodoform, and the application of a bichloride bandage. Microscopic examinations of the cultures were obtained, and inoculations on the corneæ of rabbits were made to verify the culture and establish its degree of virulence. Particular attention was given to the yellow staphylococcus, which is the most frequent cause of serious accidents following an operation.

Bernheim inoculated the eyes of eight blind human subjects with pure culture of this coccus, and concludes from his researches that we have no means of freeing the conjunctiva from the micro-organisms always to be found there, even in its normal condition; but with our usual methods of disinfection we do, on the one hand, reduce the number of microbes, and, on the other, weaken the vitality of the remaining ones, at least for several hours. By preventing their increase until the wound made by the operation has closed, we ward off the greatest danger arising from infection.

The edges of the eyelids always contain more microbes than the conjunctival sac. Their migration to the conjunctiva is a constant source of infection for the latter. M. Bernheim demonstrated these facts by direct experiments upon one of his own eyes, the first time with the *micrococcus prodigeosus* and the second time with the *sarcina aurantiaca*. It is not possible to sterilize the palpebral edges even by repeated and careful disinfection, but the number of germs can always be diminished. Professor Haab has long since given up the idea of removing cataract or cortical remains by pressure with the palpebral edges. He considers this treatment very dangerous, both on account of the microbes existing on the surface of the edges of the lids and in the lashes, and on account of those which the pressure of the finger might force out of the openings of the glands.

In forty experiments with tears taken from healthy or slightly-inflamed eyes, M. Bernheim has found that this liquid evidently has microbicidal properties, particularly for the staphylococcus pyogenes luteus. The number of these germs is diminished, without, however, their vitality being impaired. This antibacterian action does not depend on the rarity of the cellular elements contained in the tears, and must be similar to the analogous effects found in the case of serum and of the aqueous humor. Serum, however, has no effect on the yellow staphylococcus. On the other hand, some microbes are absolutely unaffected by the lachrymal liquid, as, for example, the micrococcus prodigeosus, which produces catarrhal conjunctivitis. If there are staphylococci in large numbers, tears have no appreciable effect. It is probable that in the normal state the continual renewal of the liquid, like a veritable lachrymal spray, plays an important part. On the other hand, those cocci hidden in the folds of inflamed mucous membrane—for example, in conjunctivitis and infectious keratitis—necessarily remain unaffected. A smooth and well-defined surgical cut, as in extraction, must be

less favorable to the increase of germs than an irregular one.

In order to study the effects on the microbes of the conjunctival sac and of various means of disinfection applied before and during the operation, M. Hildebrandt made bacteriological experiments on eleven patients before and at different moments after the extraction of cataract, in each case watching closely the process of healing. He found that recovery was most rapid and favorable in two cases in which the agar-agar tubes remained sterile, and in one case where inoculation produced a colony of non-pathogenic micrococci. One of these patients had first to be treated for chronic conjunctivitis. This case illustrated the disinfecting action of nitrate of silver used in the strength of two per cent. In four other cases where recovery was normal, and there had been germs, in part pathogenic, before the operation, energetic disinfection resulted in comparative sterilization, demonstrated by the results of inoculations. In these cases, in which recovery was delayed by more or less severe iritis, Hildebrandt established the presence of pathogenic staphylococci both before and after the operation. Disinfection in one of these cases had the effect of delaying the development of colonies. In another case, complicated by chronic conjunctivitis and dacryocystitis, there was only slight inflammation of the iris, in spite of the abundance of yellow staphylococci. This proves how useful antiseptic measures are. The fact that iritis occurred after the operation in these three cases, where the number of pathogenic microbes contained in the conjunctival cul-de-sac was particularly great, argues in favor of a microbic origin for those attacks of iritis which are usually attributed to other causes, such as contusion of the iris by the nucleus, or by the instruments, or from swelling of cortical remains. We do not know whether iritis is caused directly by microbes which have been in the eye or by the poisonous products of microbes existing outside of the eye. In the last case, where yellow staphylococcus was present before and after the operation, and disinfection with sublimate (1 to 5000) seems to have had no effect whatever on the number of germs, the operation became complicated on the fourth day with purulent infiltration of the cornea, followed by slow irido-cyclitis and obliteration of the pupil. The conjunctiva and lachrymal ducts were normal. The other eye, in which the operation was successful, is one of those which had iritis. The author concludes that the progress of recovery is evidently influenced by the number of microbes contained in the conjunctival cul-de-sac, and that disinfection, especially with sublimate 1 to 1000, not only diminishes the number of pathogenic microbes, but reduces their vitality. As accidents from inflammation depend on these two elements, the usefulness of disinfection, which has been questioned by Steffan, is proved beyond a doubt by these experiments. The most rigorous disinfection, together with the most exact technique in the operation, and the least bruising of the tissues, increases the chances of rapid recovery and brings us nearer ideal asepsis, as yet unattainable in the eye.

THE ACTION OF SCOPOLAMINE ON THE EYE.

L. Bellarminow (*Vratch*, No. 17, 1893; abstract in *Revue Générale d' Ophthalmologie*, July, 1883) has made some observations on the action of the new mydriatic recently proposed by Raehlmann (scopolamine). He draws the following conclusions: Scopolamine is indicated for the same cases as atropine, especially to determine anomalies of refraction and accommodation. Owing to its marked effect on accommodation, it permits of speedy and accurate determination; in addition, it considerably shortens the period of paralysis of accommodation and of mydriasis. Scopolamine is also preferable to atropine in cases of short attacks of inflammation of the cornea. In general, scopolamine has all the good effects of atropine, without its bad qualities. The author therefore thinks that scopolamine will soon replace atropine in the practice of ophthalmology.

SUBCONJUNCTIVAL INJECTIONS OF SUBLIMATE.

Gagarine (St. Petersburg Thesis, 1893; abstract in *Revue Générale d' Ophthalmologie*, July, 1893) relates his observations on the effect of subconjunctival injections of sublimate in the various diseases of the uveal tract and of the cornea. He used a solution of 1 to 1000, pure, or with cocaine. His results are as follows: In gummatous iritis (eight cases) they are brilliant; after the second or third injection (on the sixth or eighth day) the iritis disappeared or, at least, improved considerably, even in cases where the general treatment was not used; in cases of plastic or purulent iritis (nine cases) the effect of injections of sublimate was likewise excellent: a cure was effected in from six to eight days; in cases of irido-choroiditis after recurrent fever

(six cases) the influence of the injections was still more marked; in cases of irido-choroiditis (irido-cyclitis) of another origin, especially traumatic (nine cases), injections also proved very useful, acting very quickly, two or three usually being sufficient. In cases of diffuse parenchymatous keratitis (twenty cases) the injections had very little effect, or even none at all; but in cases of ulcers of the cornea with hypopyon, injections of sublimate had very favorable effects, acting even more promptly than in cases of iritis: after the first injection there was a marked improvement. In cases of episcleritis (three cases) the injections had practically no effect; and in cases of degenerated glaucoma (two cases) the effect was favorable: the pain diminished.

OPERATIVE TREATMENT OF TYMPANIC VERTIGO.

In the *Medical News* of September 30 Dr. Chas. H. Burnett attacks the view that "Ménière's disease," or, as it is now generally called, the Ménière complex of symptoms, is due to internal ear disease, generally extravasation or exudation in the semicircular canals, and recites a further series of cases, making ten in all, in which intratympanic operation has given relief. Fixing his attention upon the stapes as the real key to the situation, he now is less inclined to remove the larger ossicles if the pressure upon the inmost ossicle can be otherwise relieved. He removes only so much of the membrane as gives access to the incudo-stapedial articulation, extracts the incus, or only its long process after disarticulation, and in some cases removes the stapes also, if possible. Gain in hearing may be distinct or but little,—no unfavorable results are reported,—but vertigo was each time lessened or relieved.

REMOVAL OF THE STAPES FOR THE RELIEF OF DEAFNESS.

This operation, first advocated by Kessel in 1875, and occasionally done by accident or intention since, was given a fuller trial by Jack, of Boston, as previously reported in these columns, with favorable and promising results. An additional group of cases has been published by Burnett in the *Medical News* of March 13 and by Blake in the *Archives of Otology*, and more extended experience has been reported by Jack, with continued immunity from bad results. But at the meeting of the American Otological Society in July both of the latter operators reported some unfavorable cases and acknowledged the dashing of the hopes at first entertained. Similar reports come from various directions, with occasional successes; but most aural surgeons are feeling their way very cautiously in the matter, and have been unwilling to extol or decry the measure on the basis of very few experiences. It is so rational, in view of our knowledge of the pathology of many cases, to free or extirpate the stapes, if this can be done with such safety as these instances generally indicate, that it will be a severe blow to the hopes of many if it prove unsafe or futile. Yet Bezold caused such serious vertigo, vomiting, and fainting in his first patient that he fears to repeat the experiment, although she recovered after some weeks a portion of the hearing of which the operation had totally robbed her. In this case the vestibule had not been opened or drained. Lemcke reported at the same meeting of the German Otological Society one unintentional extraction of his where hearing was diminished after it. Wolff had extracted in one case with production of but slight vertigo and some gain in hearing. It is singular that the suppurative cases, where the peril of septic infection of the labyrinth would seem greatest, have not yet given as unfavorable results as some easy and almost ideal cases for operation.

STACKE'S OPERATION OF OPENING THE ATTIC AND ANTRUM FROM THE MEATUS.

In the Société Française d'Otologie et Laryngologie, Dr. Lubel-Barbon reports upon the excellent results obtained in some cases by this measure. Of eight cases cited (the results of five subsequent ones are not given), four were fully cured, although some were unaided by excision of the ossicles. Four were still under treatment, one being a case of large cholesteatoma of the antrum region, suspected but not surely diagnosticated until found and removed in the operation. Similarly good results were reported by Dr. Holmes, of Cincinnati, at the Milwaukee meeting of the American Medical Association, although he follows Schwartze's modification in trephining the mastoid and opening the antrum before attacking the tympanum from the canal. The operation is thus somewhat easier to do safely and more complete in such cases as demand this more radical measure. Where not clearly demanded, any needless opening of the mastoid tissue is to be deprecated. The chiselling is rather dangerous work in these operations, and rongeurs have been devised by Hartmann, Politzer, and Dench, and the dental burr has been used by Snarezde Mendoza and

warmly commended. Such intervention is certainly more complete than mere excision of the ossicles in cases of attic caries, and although reserved for the worst cases, or as a later measure where excision has failed, is likely to be more and more employed in the future.

A NEW TREATMENT OF MAMMARY ABSCESS.

TWEEDY (*Medical Press and Circular*, July, 1893) adopts Weber's method of treating mammary abscess.

An early and free incision is made in the breast, radiating from the nipple, and situated at the most dependent part of the abscess.

The finger is then inserted into the wound and the gland structure broken down. This manipulation, it is stated, will have no bad effect on the healthy tissue.

By this process several new cavities will be found, and these, in turn, are to be opened by an incision similar to the first, and the whole thoroughly douched with some antiseptic solution.

The membrane lining the several cavities is to be curetted, and the *débris* removed by a second douching.

Strips of gauze sufficient to fill every interstice of the abscess are to be steeped in a one-per-cent. solution of carbolic acid, and inserted by means of a long sinus forceps and probe. A large, flat sponge is then placed on the breast and tightly bandaged thereto for twenty-four hours. After this period the dressings are removed, and without further irrigation the cavities are again packed, the sponge and bandage being reapplied as before.

On the third day the process is repeated.

In the fourth dressing the gauze packing is dispensed with and the incisions are drawn together and dressed antiseptically; the sponge and bandage are reapplied.

This last process is repeated every twenty-four hours until healing is complete; this usually takes place about the tenth day. In one of the author's cases the whole process was accomplished without the aid of anæsthesia. In only one of his cases was it necessary to make a second incision. The incisions are never longer than is necessary to admit a finger.

Iodoform gauze should be used for packing the wounds.

The author only having treated five cases, cannot say definitely what portion of the above treatment is essential, but he is strongly inclined to the opinion that curetting can be safely dispensed with.

THE TREATMENT OF FRACTURES OF THE LOWER EXTREMITY.

SCHMID (*Centralblatt für Chirurgie*, August, 1893) holds that in the treatment of fractures of the lower extremity immobilization must not be carried out too long, and that the joint must be kept as free as possible; passive motion, especially in fractures involving the joints, must be begun early.

In all fractures below the lower third of the femur a plaster-of-Paris bandage is applied, the joint being as free as possible, and the patient is allowed to get up in a week. This, in old people, is a great advantage, as all dangers from too long confinement to bed are avoided.

The author is of the opinion that the fractures unite with greater rapidity when the patient is allowed to go about than when confined so long in bed.

After a patient is admitted to the hospital, the fracture is reduced and the limb surrounded with a plaster-of-Paris shell and elevated. The seat of fracture is then surrounded by an ice-bag in order to hasten the absorption of blood.

In from three to five days all swelling has disappeared, the limb is again subjected to strong extension and counter-extension, and a plaster-of-Paris bandage is applied. The next day the patient gets out of bed. If the swelling has not entirely disappeared, or the exact position of the fracture is not known, the plaster bandage is removed on the eighth day and again applied. The patient uses crutches for the first two days, then two sticks or canes for the next two days, then one cane. When the plaster dressing is removed, the limb is to be bathed, douched, and massaged, and the function of the joint re-established by passive motion.

RECOVERY FROM CHRONIC GLANDERS.

HOLMES (*Journal of the American Medical Association*, August 12, 1893) holds that glanders is rare in man, and that it presents itself in two forms,—one acute and rapidly fatal, terminating, as a rule, within two or three months; the other chronic, from which the patient may recover after one, two, four, or five years.

The author reports the following case: The patient, a well-developed man, aged twenty-two, had always been well and strong, and lived on a farm all his life. Two of the horses under his care died of glanders. Some time during the middle of December, 1889, a felon appeared on one of his fingers. There was no adenitis

nor lymphangitis, and no rise of temperature nor chill. Before the felon was entirely healed five suppurating foci appeared in different parts of the body,—one at the elbow, one at the vertex, one on the right side of the lower maxilla, one in the right thigh, and one in the right calf. These foci appeared three weeks after the beginning of the so-called felon. They each began with a sharp, stinging pain, much like a bee-sting, with deep swelling and little or no œdema or redness. When the patient was first seen the temperature was 100° F. and the pulse 92. When the sores opened they presented somewhat the appearance of tubercular abscesses, but with this difference: the abscess-wall was covered with a firm, hard, almost shot-like, bright-red granulation tissue, and the exuding secretion was sanguinolent. Inoculation on guinea-pigs and rabbits proved the presence of glanders. The treatment of this case is most important, since it ended in recovery. The five abscesses were opened under ether, curetted, and swabbed out with a saturated solution of sulphate of zinc. They were then packed with iodoform gauze wet with a saturated solution of iodide of potassium. The wounds healed slowly. During the entire course of the disease the patient had fourteen foci of ulceration.

FIXING A DISPLACED LIVER.

RICHELOT (*Medical Press and Circular*, July, 1893) relates the case of a woman, aged twenty-eight, in whose right iliac fossa could be felt a painful floating tumor. The patient was seized from time to time with bilious vomiting and fever, so that she had to cease all work. Believing it to be a case of typhlitis, the author opened the abdomen and laid bare the tumor, which was found to be the liver, fixed by adhesions to the iliac fossa. The adhesions having been broken up, the liver was pushed up as high as possible and fixed. The result was very favorable; the patient suffered no more inconvenience and could walk about with ease.

THE TREATMENT OF WOUNDS OF THE BRAIN.

ADAMKIEWICZ (*Therapeutische Monatshefte*, August, 1893) claims that the various antiseptic solutions exert a harmful influence on the brain when used in the treatment of wounds of that organ.

Solutions of carbolic acid and boric acid were injected into the brains of animals with a Pravaz syringe, and various disturbances were produced, and in many of the experiments the animals soon died.

There is always great danger of producing a meningitis after the use of antiseptic solutions; at the same time no bad results have been reported after the use of sublimate or carbolic acid. A three-per-cent. solution of boracic acid is too weak to be of any special value as an antiseptic.

AN ORIGINAL METHOD OF RESTORING THE ALVEOLAR ARCH IN ANTERIOR CLEFT OF THE HARD PALATE AND OF CORRECTING THE DEFORMITY OF THE ALÆ NASI IN HARELIP.

WYETH (*Journal of the American Medical Association*, August, 1893) says that it is a common experience, after plastic work on the soft parts in cases of complete harelip and cleft palate, for the ala nasi of the affected side to still remain misshapen, flat, and sunken.

If the maxilla be normal and the alveolar arch in front complete, each ala nasi rests upon a bony surface and foundation on the same plane, and the two are naturally symmetrical. If one is deficient, the nostril of that side sinks down and out of line, just as the corner of a house does when the underpinning is not high enough. In certain cases of anterior cleft the intermaxillary process is adherent to one side (long side) and projects in a clumsy fashion, usually to the front and upward. In these cases the old method of bending or forcing this misplaced process over to the short side and holding it in contact until union has taken place completes the arch and gives a suitable foundation for successful plastic work on the nostril and lip.

When, however, this process is absent or largely deficient, we find one ala nasi resting upon a normal portion of the alveolar arch on one side, while on the other it recedes from one-half to one-quarter of an inch, resting upon an imperfect maxilla and alveolar process.

In four such cases the following operation was devised and carried out: About one-quarter of an inch from the edges which are to be brought in apposition a hole was drilled through the bone and a strong silver wire carried through, ready to be tightened.

The edges were freshened by slicing off the mucous membrane lining the bone with a strong scalpel or scissors. With a very strong pair of scissors in very young infants, or a bone-cutter, the alveolar arch and maxilla of the short side was divided about half-way of its length and at

right angles to the dental surface. By introducing a stout cord of silk or wire into this fissure, and making strong traction forward, the undivided portion was fractured and loosened, when, by tightening and twisting the silver wire previously introduced, it was brought forward and firmly anchored.

Since the nutrition of the bone in its new position is derived temporarily from the adherent soft parts, these are not disturbed until the bone unites in its new position. From six to eight weeks should elapse before plastic work on the lip and nose is undertaken.

Early operation is essential, always within the first years of life, and preferably within the first few weeks after birth, provided that the nutrition of the child be good or can be improved by forced feeding.

GASTROSTOMY AND THE FORMATION OF AN ARTIFICIAL ANUS.

HELFERICH (*Therapeutische Monatshefte*, August, 1893) describes as follows the formation of an artificial anus: The abdomen being opened, the peritoneum is sutured to the skin by means of a continuous catgut suture. The colon is drawn out so far that an opening can be made in the mesentery and a rubber tube surrounded with iodoform gauze pushed through and fastened outside of the wound. This prevents the gut falling back into the abdomen. In from three to six days a spindle-shaped piece of the colon is removed in the long axis, so that the edges of the incision will not have a tendency to come together.

In operating for impermeable stricture of the œsophagus, an incision should be made above the navel parallel and to the left of the linea alba, completely dividing the rectus. Two flaps are then dissected up from the outer surface of the stomach parallel to each other and to the abdominal wound. A small opening is made through the remaining tissue into the stomach and a rubber tube introduced. These two flaps from the outer surface of the stomach are then sutured together around the tube with catgut, forming a sort of canal. This canal is then sutured to the abdominal wound and allowed to heal. When food is required, a tube can be introduced into the stomach through this artificial canal.

REPORT OF A CASE OF SPLENECTOMY.

PAINE (*Kansas City Medical Index*, August, 1893) claims that operations on the spleen are most successful when necessitated by traumatism. Nussbaum states that in twenty-six examples of complete extirpation of the spleen necessitated by injury of the abdomen, sixteen were successful. Ashhurst has collected twenty-one cases terminating in recovery. Herbert reports twenty-nine splenectomies for diseased conditions; sixteen were for leucocythæmia, and all were fatal. Of the remaining thirteen cases, eight recovered. Ashhurst has collected forty-three cases of splenectomy for disease, thirty-one of which terminated fatally.

The author's case, a young girl, aged twenty-five, had always lived in a malarial district, and had suffered from irregular attacks of malaria since childhood. At the time of examination a movable tumor was discovered in the lower part of the abdomen, which slowly increased in size and gave rise to constant pain. Some months later, after a protracted attack of fever, the tumor became fixed in the left iliac region. At the time of operation the patient was much emaciated and anæmic, and had a temperature varying between 100° and 103° F. Quinine was freely used, but without any appreciable effect. The linea alba was incised for four inches; hemorrhage was very free, but was promptly controlled by pressure forceps. The peritoneum was incised and the omentum found firmly bound to the spleen. This was detached, and revealed extensive adhesions between the displaced viscus and the surrounding parts. The adhesions were carefully broken up and ligatured when necessary. The most difficult and critical part of the procedure was the tying and liberation of the extensive vascular adhesions between the upper border of the spleen and the transverse colon. The pedicle was then transfixed with a double ligature and tied, the ligatures cut short, and the pedicle dropped back into the abdomen. The peritoneal cavity was thoroughly douched with Thiersch's fluid and mopped dry with sponges. The external wound was closed with interrupted suture, no drainage being used.

The extirpated spleen weighed about three pounds. The patient entirely recovered and was out of bed at the end of three weeks.

Faintness and persistent vomiting did not follow the operation, and no enlargement of the lymph-glands could ever be detected.

WOUNDS OF THE HEART.

LUMNICZER (*International Journal of Surgery*, August, 1893) has reported five cases of wounds of the heart and pericardium, only one of which terminated fatally; and Peebles, of Omaha, reports a case of bullet wound of the

heart with recovery. Notwithstanding the perfection of our methods of examination, the diagnosis of heart wounds is still a matter of extreme difficulty. There is no pathognomonic symptom, and the diagnosis must be arrived at from an analysis of the symptoms. Hemorrhage, pain, frequent attacks of syncope, and the physical signs of hemorrhage into the pericardium are usually found present. Dyspnœa is a less constant symptom.

Cases in which the heart has been perforated by a needle give the best prognosis; then follow penetrating and gunshot wounds. Sudden death after heart injuries is due chiefly to shock, to anæmia of the brain and lungs, and to inability of the heart to contract, both in consequence of the wound and because of the pressure of the pericardial effusion. In cases where death does not occur for a number of days, it is usually attributable to some complicating lesion, such as inflammation of the pericardium and, less frequently, of the cardiac tissue. If death is delayed to a more remote period, it is due to the giving way of the cicatrix or to accumulation of inflammatory products in the pericardium.

In the treatment of such injuries opium should be used to relieve the pain, stimulants to counteract the shock, and cardiac sedatives to prevent excessive action. In the treatment of complicating pericarditis and pleuritis the aspirating-needle deserves a prominent place. In one case the wound was enlarged and the cavity of the chest thoroughly explored with the finger and the heart lesion packed with gauze. The case recovered.

HEMORRHAGIC INFARCTION OF THE SCROTUM.

ENGLISCH (*Prager Medicinische Wochenschrift*, 1893) reports three cases of hemorrhagic infarction of the scrotum. The disease consists essentially in a thrombosis of the veins of the pampiniform plexus; in consequence, the vessels are distended with red blood-corpuscles, the smallest appearing on the point of bursting. The different structures of the testicle are crowded apart and an effusion of blood takes place on the inner surface of the tunica fibrosa. The symptoms are usually indefinite and generally point to the presence of peritoneal trouble. Abdominal pains radiating towards the scrotum, vomiting, diarrhœa, and fever are followed on the second or third day of the disease by swelling of the scrotum, and induration of the cord. The epididymis is not markedly involved. Although the scrotum appears greatly swollen, an incision gives vent to a remarkably small quantity of fluid. The testicle is only slightly sensitive, and when incised its substance appears of a dark-brown color, the vessels being greatly distended. The lumen of the seminal ducts is, for the most part, obliterated.

Experiments on animals have shown that ligature of the internal spermatic artery, as well as of the pampiniform plexus, produces the same appearance as hemorrhagic infarction.

The author has not infrequently observed hæmatoma of the spermatic cord in children, which closely resembles, externally, the disease under consideration. The majority of these children are born in the breech position.

Nicoladoni regards torsion of the vas as the etiological factor, and as the affection involves especially the left testicle, the length of the veins must be considered of some significance. The author thinks it possible that strong contraction of the abdominal walls might produce coagulation of the blood in the internal spermatic vein, although in most cases no history of mechanical irritation could be obtained. It is worthy of note that the peritoneal symptoms precede the development of the tumor, and that some of the patients were in collapse when admitted to the hospital.

As regards the treatment of these cases, Volkmann recommended castration as early as possible. The author advocates an expectant plan of treatment; at first strictly antiphlogistic. At the end of a few days deep incisions may be made into the substance of the testicle, since in this way it may be possible to preserve a portion of the gland. In one case the disease was arrested by antiphlogistic measures, and although the testis underwent atrophy, the epididymis and vas retained their normal size.

THE TREATMENT OF BUBO.

RICHTER (*International Journal of Surgery; International Klinische Rundschau*, 1893) has employed injections of the benzoate of mercury in thirty cases of bubo. This method is applicable to all stages of the affection, and even to cases where extensive fluctuation with thinning of the skin is present. In cases of slight glandular enlargement without cutaneous redness or tendency to suppuration, the treatment has not been employed.

As regards the technique, the strictest antiseptic precautions are employed. The canula of the syringe should be boiled before each injection, and the syringe should be disinfected in a five-per-cent. carbolic-acid solution.

The skin over the bubo is shaved and disinfected with sublimate solution (1 to 5000) and washed with ether and alcohol. The injections are made at three places into the swelling, half a syringeful being injected each time, and if fluctuation is present, usually at the point where this is most marked. After injection Burow's solution is applied (alum, 5 parts; acetate of lead, 25 parts; distilled water, 500 parts), and compression exerted by a cushion of wood-wool and a gauze bandage. After injection the pain increases in severity for four or five hours and then subsides, together with the inflammatory phenomena. In two cases swelling of the joints developed. In fourteen cases where no fluctuation existed, this condition was developed by treatment. In thirteen cases where fluctuation was present, it was increased. Disappearance of fluctuation, with absorption of the liquefied glandular matter, was observed in only three cases.

As the fluctuation always increased after injection, early puncture was made. The punctured opening was prevented from closing by a strip of iodoform gauze, and was irrigated daily with sublimate solution (1 to 5000). Of thirty cases treated in this manner, twenty-five were cured, the average period being twenty-seven and a half days. In twelve cases where the inflammatory symptoms failed to subside after the first injection, followed by puncture, the injection was repeated.

A NEW METHOD OF DIRECT FIXATION OF FRAGMENTS IN COMPOUND AND UNUNITED FRACTURES.

SENN (*International Journal of Surgery*, August, 1893) makes an earnest plea in favor of more frequent recourse to direct means of fixation in compound and ununited fractures.

His conclusions are as follows:

1. Direct fixation of the fragments is indicated in all compound fractures in which perfect retention cannot be secured by simpler measures and in the treatment of ununited fractures requiring operative interference.

2. This method is also justifiable in certain forms of subcutaneous fracture in which reduction and retention cannot be accomplished without it.

3. Free exposure of the fragments in compound fractures secures the most favorable condition for thorough disinfection.

4. Perfect reduction and direct fixation of the fragments are the most reliable prophylactic measures against delayed union, non-union, and deformity.

5. A compound fracture should be regarded in the same light as an injury to the soft parts, and should be treated upon the same principles.

6. Bone sutures and ivory nails do not furnish the necessary degree of support and immobilization in the direct treatment of fracture.

7. The hollow perforated bone or ivory cylinder devised by the author answers the same mechanical purpose without the objections which have been charged against the solid cylinder. Such cylinders should be made from the shafts of long bones of young animals, such as chickens, turkeys, or rabbits.

8. Fractures not requiring drainage should be closed with buried and superficial sutures.

9. The external splint should be so applied as not to require changing during the entire course of the treatment.

A CASE OF SUPRAPUBIC CYSTOTOMY IN WHICH THE BLADDER WAS DISTENDED WITH AIR INSTEAD OF WATER, AND FOUR HUNDRED AND NINETY-FIVE CALCULI REMOVED.

KEEN (*Journal of Surgery, Gynæcology, and Obstetrics*, July, 1893) reports the case of a man, aged seventy-five, who for several years had been passing small calculi with the urine at frequent intervals and in considerable quantity. Four days before the operation he had retention. Examination by the rectum showed a very large prostate. In operating upon the bladder air was injected into this viscus until it formed a distinctly elastic tumor in the middle line. At its upper border was another tumor one inch and a half in diameter, which was found later to be a distended pouch. As soon as the bladder was opened the air escaped. The edges of the bladder wound were seized with hæmostatic forceps, and the calculi were removed with the finger and a scoop. They were counted after the operation and found to be four hundred and ninety-five. The entire weight was three hundred and eighty-six grains.

The rectal bag was not used during the operation, for it was found that the bladder could be lifted up more with the air alone than with the rectal bag.

The use of air has the advantage that there is far less danger of rupture of the bladder, because the air is much more compressible than water and it lifts the bladder better. Another advantage of the air is that it gives a dry wound instead of one filled with blood and stained fluid.

A NEW METHOD FOR THE RADICAL CURE OF VARICOSE VEINS.

LAPLACE (*Journal of the American Medical Association*, August, 1893) thinks the initial stage of varicose veins is a trophic disturbance, sometimes hereditary and sometimes acquired. Of the radical measures employed for the cure of this trouble the choice lies between acupressure, ligature, and excision. Acupressure is a tedious operation, complicated, very seldom accompanied by success, and exposes the limb to the dangers of sepsis and embolism.

Mollière employs a solution of one part of iodine, nine of tannin, and two hundred of water, of which he injects a few drops directly into the vein with a view of producing coagulation.

Phelps recommends the multiple ligature of varicose veins, fully aware, however, of the strictly local effect and the recurrence of the condition.

Patterson, after placing harelip pins, injects perchloride of iron.

All of these methods are painful, tedious, and so limited in their application that complete relief would necessitate the procedure over the whole area of dilatation, which would overtax the endurance of a patient.

The first case operated upon by the author was a man, aged fifty-four, who had varicose veins of both legs for twenty years. Cocaine was injected about the saphenous opening in both thighs; the long saphenous vein was ligated. The vein can be found very easily, immediately under the integument and superficial fascia, one and one-half inches below Poupart's ligament and one and one-half inches from the inner side of the thigh. The vessel is isolated and a silk or catgut ligature applied. The incision need not be more than one inch in length. A suture closes the wound, and it is finally sealed with iodoform collodion. The same operation was performed upon the short saphenous vein by making an incision about two inches below the centre of the popliteal space. The vein is generally distended and presents itself in the area thus exposed. There was after the operation a hardened and distended condition of all the varicose veins, not accompanied with pain. A cotton compress and bandage were applied from the leg to the upper femoral region. On the third day the bandage was removed; the veins stood out plainly, presenting a hard, nodular appearance, easily comparable to a rope under the skin. All about them was a yellowish-green coloration, no doubt due to some red corpuscles that had exuded through the distended stomata of the vessels. In two weeks the patient was allowed to get out of bed, and was soon able to walk about in comfort. In sixteen other cases the author has operated upon, six were in both limbs and ten in one limb. Five were women and eleven were men. Whether the varicose condition was small or extensive, the same operation was performed.

In a foot-note Wyeth makes the following suggestion: Varicose veins are often the result of a compensation after an obliteration of the femoral or popliteal veins. If in such cases the veins were ligated, gangrene would result.

Reviews.

SYSTEM OF DISEASES OF THE EAR, NOSE, AND THROAT. Edited by Charles H. Burnett, M.D., Emeritus Professor of Otology, Philadelphia Polyclinic, etc. Vol. I. 8vo, 789 pp., 235 illustrations and 34 plates.
Philadelphia: J. B. Lippincott Company, 1893.

This elaborate work from the pens of a group of leading specialists in America and England appears at the same time with a similar publication in Germany under Professor Schwartze's editorship, and suffers little in comparison in some of its sections, although treating far less exhaustively the more scientific aspects of the subject. The chapter of nearly one hundred pages by Dr. Bryant, of Harvard, on the anatomy and physiology of the ear, is full, well illustrated, and generally satisfactory, although the inclination of the drum-head is stated to be only forty-five degrees downward and ten degrees forward, Kessel's misleading diagram of its outer surface is retained, and other minor statements are open to criticism. Dr. Huntington Richards's chapter on the examination of patients is admirably precise and minute, but will probably weary those who do not appreciate the need of so much detail. Affections of the auricle are well treated by Dr. Dench, and those of the external canal by Dr. Barclay, with an elaborate account of the parasitic plant forms there met. Sir Wm. Dalby deals with foreign bodies in the canal, bony growths, and occlusions. In regard to foreign bodies, he speaks from the stand-point of the skilled specialist in lauding a small hook for the extraction in the rare cases seen before complication by injudicious intervention, and only the expert aural surgeon should ever follow his plan. For the bulk of cases the syringe, for the hot douching of the inflamed tissues and the ultimate removal of the intruder, is accorded its proper position, and the necessity as well as the safety

of expectancy is well emphasized. Like other British surgeons, he sees many exostoses and hyperostoses, such as are rare outside of private practice in that country, and warmly advocates the dental drill for such cases as imperatively forbid the usual let-alone policy. Dr. Gorham Bacon contributes an excellent chapter upon affections of the drum-head and the acute inflammations of the middle ear, laying stress upon abstraction of blood in the primary stage, hot douches and gentle inflation, and the importance of caring for the concomitant and generally causative naso-pharyngeal condition. Mediate applications of cold to the mastoid, with rest in bed, are urged for cases threatening involvement of the mastoid cells; and, while unwilling to condemn the Wilde incision, he evidently believes it needless in cases where empyema may be aborted and insufficient where pus demands operation.

Chronic catarrh of the middle ear is well described by Dr. Sexton, as is chronic suppuration by Dr. Burnett; but in each article the predilection for excision of the drum-head and ossicles gives a strong coloring to the section on treatment. For chronic catarrh, the routine measure of inflation is credited with little value except in opening the occluded tube in early stages, and any other effect from it or from liquid or vaporous injections into the tympanum is disbelieved. Mobilization of the conducting apparatus by it or by massage with pneumatic speculum or spring-probe is unmentioned. "The radical operation . . . is really curative in the sense that it not only arrests the further progress of the disease and conserves whatever functional capacity is left, but also in most cases causes marked improvement in the hearing and a permanent abolition of the tinnitus." One case of improvement in hearing from six inches to twenty feet for ordinary voice is cited, with the admission that such gains are rare; "yet in nearly all the author's cases there was more or less improvement in hearing." Detailed statistics are not given.

In discussing purulent inflammation of the tympanum, Dr. Burnett advocates both the syringe and cotton-carrier as needful to obtain asepsis, and the dry treatment by powders as best able to maintain it. If after two or three months this has not succeeded, "in all cases of chronic purulency of the drum-cavity the malleus and incus will be found more or less invaded by caries," and they should be excised. The electric illumination is credited with marking an epoch in the operation, and the hundreds of excisions of Schwartze seem to be ignored because not so done. In attic disease, excision is regarded as almost essential to cure, for "perforation in the membrana flaccida always means necrosis in the malleus and perhaps in other of the ossicles,"—a judgment which will not be accepted by the profession generally until more facts and longer observation have better justified it. Meningitis, brain-abscess, and pyæmic conditions consequent upon tympanic suppuration are well set forth, with a leaning to the idea that these always call for the general surgeon, who is beginning to awaken to the teachings of otology, and to assume that sinus-thrombosis and pyæmia can be cured only by his intervention. A quotation of some of the numerous cases of otitic septicæmia recovering without sinus operation under strictly aural treatment would have been fitting and instructive.

Dr. Jack's article upon the removal of the stapes for the relief of deafness belongs rather to the preceding year, as the subject has shrunk somewhat in another year's seasoning. Dr. Blake's chapter upon disease of the mastoid is admirable, giving an exposition of the surgical anatomy, detail as to operative procedures, and illustrative notes of twenty-one cases, most of them cured without operation upon the bone. Good chapters by Dr. Spear on the internal ear, on the tympanum in relation to general disease by Dr. Colles, and on the ocular lesions of aural disease by Drs. Oliver and Cleveland complete the aural portion of the work.

The rhinological portion opens with Dr. MacCoy's chapter on anatomy and physiology. Dr. Dabney, of Louisville, contributes that on examination, and Dr. Wagner, of New York, that on local therapeutics. Acute rhinitis is treated by Dr. Bosworth, hypertrophic rhinitis by Dr. Seiss, and the atrophic form by Dr. J. N. Mackenzie. Dr. Major, of Montreal, deals with tuberculosis, diphtheria, etc.; Mr. Cresswell Baber, of Brighton, with foreign bodies in the nose and epistaxis; Dr. Seiler with influenza; and Dr. Bryan, of Washington, with disease of the accessory cavities of the nose.

The work is not very voluminous, and while it hardly answers the expectation as an encyclopædic book of reference, it forms a good, readable, and fairly full treatise, with good accord among its many authors.

B. A. R.

HEATH'S PRACTICAL ANATOMY AND MANUAL OF DISSECTION. Eighth edition. Edited by William Anderson, F.R.C.S. Illustrated.

Philadelphia: P. Blakiston, Son & Co., 1893.

In some respects the book now under review is almost as well known to the medical profes-

sion as Gray's Anatomy. It forms a complete, concise, and accurate guide to the medical student who is studying the anatomy of the human body at the dissecting-table. The revisions which have been made to this edition have been designed to bring the book up to the level of the present requirements in the various examining boards, and an effort has been made to condense the book as much as possible. Notwithstanding this fact, new matter to the extent of one hundred and fifty pages has been added. The plates of arteries prefixed to the last three editions and a number of histological illustrations have been expunged. The volume now forms a handy manual of seven hundred and fifty pages, small octavo, and will doubtless continue to be as popular as heretofore, although its price (five dollars) must necessarily tend to make a market for cheaper manuals.

A TEXT-BOOK OF MEDICINE FOR STUDENTS AND PRACTITIONERS. By Adolf Strümpell, M.D. Second American edition, revised from the sixth German edition, by H. F. Vickery, A.B., M.D., and Philip Coombs Knapp, A.M., M.D. With editorial notes by F. C. Shattuck, A.M., M.D. Illustrated.
New York: D. Appleton & Co., 1893.

There is probably no text-book upon the practice of medicine in the English or German language which is equal in quality with that of Strümpell. Its nearly eleven hundred pages, closely printed, in comparatively small type, contain an amount of information which is not to be found in any similar book. This American edition also has one characteristic which separates it distinctly from many other works of German authors which have been translated into English, in that the diction is so clear and smooth that one feels as if the author must have written in English instead of in German. The translators are, therefore, to be congratulated upon having accomplished their work with unusual success.

Among the points which strike us as worthy of note may be mentioned the statement that gurgling in the right iliac fossa is not of as much diagnostic importance in typhoid fever as has been generally taught, and we are surprised to find that Strümpell does not consider tympanites a common condition in this disease. He believes that typhoid pneumonia is due to the localization of the typhoid poison in the lung and not to a double infection. The diet which he allows in enteric fever is certainly much more free and liberal than that which is commonly employed in America. Another point of interest is that he strongly recommends the class of remedies known as "antipyretics," a recommendation which we are rather surprised to find emanating from Germany, and which is certainly not the opinion of the best practitioners in this country. In the article upon "Disinfection" (which has been added by the editor, and which is chiefly derived from the report of the American Public Health Association) we find that mixtures of corrosive sublimate and potassium permanganate, or sulphate of copper, are advised. We do not believe that either corrosive sublimate or potassium permanganate should ever be used mixed with anything but water for such purposes. The only criticism that could be offered upon the article on "Enteric Fever" is that the discussion of its treatment is too brief and the directions are not sufficiently definite. We note that for the membranous sore throat of scarlet fever peroxide of hydrogen is considered the best remedy, and for the enlargement of the cervical glands in this disease carbolic-acid injections are recommended.

For the scarlatinal inflammation of joints the author recommends the employment of from 45 to 60 grains of salicylate of sodium, which is an enormous amount of this drug to administer to a child, even in rheumatism, and the editor does well in placing an exclamation mark after the recommendation of such a dose.

The description of rötheln is, we think, disappointing.

We note that the author does not recognize the identity of the streptococcus of pus and erysipelas, and the Klebs-Löffler bacillus is not positively recognized as the cause of diphtheria. Although the author believes that membranous croup and diphtheria are identical, the editor seems to doubt this conclusion. The only mention of amœbic dysentery to be found in the book is that made by Dr. Shattuck; and the articles upon "Yellow Fever," "Dengue," and "Typho-Malarial Fever" are also by the editor. Quinine and salicylates are recommended in cerebro-spinal meningitis. This recommendation we believe to be distinctly erroneous and calculated to increase the severity of the attack. The nervous diseases affecting the larynx are placed under the general heading of the "Respiratory Diseases" rather than those of the nervous system.

In regard to the treatment of bronchitis by compressed air, Strümpell expresses an unfavorable opinion, and the wet pack, which is recommended on page 184, would become a hot pack in a few minutes, and would accomplish quite the opposite result from that which is desired.

We are interested to note that the author believes that phthisis is a rare sequelæ of croupous

pneumonia, which, we think, hardly accords with the experience of American physicians; but the important point is emphasized that heart-failure often results, in pneumonia, not from the pulmonary disease, but from unrecognized pericarditis. The advantages of climate in the treatment of phthisis do not seem to be well recognized by the author. The article upon the "Diagnosis of Heart-Disease" is, we think, disappointing, although the subject is, of course, a difficult one to deal with.

We have made these criticisms as we have gone over the pages of this interesting work not for the purpose of condemning any part of the book, but simply because they stand out prominently in contrast to the general excellence of the volume.

We are not surprised that the book has reached the sixth edition in its native land and a second in this country, and we believe that the works of American authorship upon the same subject will need the protective tariff of patriotism if they expect to surpass this translation in popularity with practitioners and students.

THE RETROSPECT OF MEDICINE. A half-yearly journal. Edited by James Braithwaite. Vol. CVII. January to June, 1893.
London: Simpkin, Marshall, Hamilton, Kent & Co., Limited, 1893.

Braithwaite's Retrospect, originally holding the field as the chief summary of medical literature, has been surpassed in its scope by other volumes of newer growth, but we doubt whether these newer institutions, even if they survive the years that have already passed since "Braithwaite" was established, will possess all the good qualities which year by year are added to rather than subtracted from this valuable epitome. The selections from current medical literature which make up this volume consist of abbreviated or complete articles taken from the best journals and the best authors during the first half of the year, and the book forms a useful supplement to the current medical journal in the hands of the well-read practitioner of medicine.

ANATOMY: DESCRIPTIVE AND SURGICAL. By Henry Gray, F.R.S. Illustrations by H. B. Carter, M.D., with additional drawings in later editions. A new American from the thirteenth English edition. Edited by T. Pickering Pick.
Philadelphia: Lea Brothers & Co., 1893.

As is well pointed out in the publisher's notice to this new American edition, a book which since 1857 has been the recognized text-book used by the great majority of English-speaking students of medicine requires no introduction to the profession. The work represents a subject which, in one sense, is the alpha and omega of medical study. Anatomy is one of the few branches which is studied by the novitiate in medicine, and a knowledge of it in its finer details remains necessary to the doctor throughout his professional career. Gray's Anatomy has no rival for the student, and, old as it is, rivals McClellan's work for the doctor. As with some of the previous editions, this one appears with colored illustrations, but naturally there is not very much that is new added to its pages. The illustrations are as clear and well defined as they have always been, and much space is saved by the familiar small type with which minor points are given.

A DICTIONARY OF MEDICAL SCIENCE. By Robley Dunglison, M.D., LL.D. Twenty-first edition. Thoroughly revised and greatly enlarged, with the pronunciation, accentuation, and derivation of the terms. By R. J. Dunglison, A.M., M.D.
Philadelphia: Lea Brothers & Co., 1893.

During the period of hibernation through which Dunglison's Medical Dictionary has passed, a number of other works, both larger and smaller, have been put forward with various claims as to their convenience and practical value; yet to the physician who wishes to have in his bookcase at once an old friend with whose methods he is familiar and at the same time a volume brought up to the latest date, Dunglison's Dictionary must remain the favorite.

It is worthy of note that the newer method, which consists in part in the dropping of the final *al* from certain adjectives and of the final *e* from certain chemical terms, has not been carried out in this work. We believe that Dunglison's Dictionary will speedily regain the position it originally held as an aid to medical literature, and that it will continue to maintain for many years to come the lead which it obtained through its sterling worth many years ago.

ESSENTIALS OF BACTERIOLOGY. FOR THE USE OF STUDENTS AND PRACTITIONERS. By M. V. Ball, M.D. Second edition. Illustrated.
Philadelphia: W. B. Saunders, 1893.

If it is possible to consider the somewhat complex subject of bacteriology in a manual of two hundred pages without the subject suffering sadly as a result of abbreviation, then Dr. Ball has accomplished his task in a very satisfactory manner. The colored plates which are scattered through the book, and the black and white micro-photographs which appear just before the index, are unusually clear and very

instructive. We doubt not that the book will succeed in the line of work for which it was intended,—namely, to give the student about to pass an examination in bacteriology the salient points which he requires for the examination-room.

CLINICAL GYNÆCOLOGY: BEING A HAND-BOOK OF DISEASES PECULIAR TO WOMEN. By Thomas More Madden, M.D., F.R.C.S., Ed. With 259 illustrations. Philadelphia: J. B. Lippincott Company, 1893.

This work appears in the form of lectures somewhat following the type of that admirable clinical manual of gynæcology issued by Dr. William Goodell. In accordance with the custom of our English collaborators, to the distinguished author's name as it appears on the title-page are appended a number of letters of the alphabet, and then follow some eleven tersely-expressed lines stating the honorable positions which he has at one time or another filled. To the American reviewer it is a great pleasure to find in this no doubt incomplete list that the position of honorary member of the Texas Medical Society is deemed worthy of mention immediately after an allusion to a decoration with the cross of bronze conferred by grateful France for services rendered in the war of 1870 and 1871.

After this somewhat imposing title-page follow some forty-seven lectures in which the subject-matter is for the most part very clearly presented. The American writers on gynæcology receive full credit.

The second lesson upon methods of gynæcological investigation contains the customary thrust at the modern electrical illuminators, and a speculum of the author's modification, presumably containing a candle, is suggested as fulfilling all the requirements of such an instrument.

Purulent infantile vulvitis is attributed to a scrofulous diathesis, to neglect of cleanliness, or to exposure to wet and cold. The author does not admit that a large number of these cases have their origin in gonorrhœal infection.

In discussing urethritis the pathognomonic value of the gonococcus is not accepted.

Cystitis, when it becomes chronic and inveterate, so that operative interference is required, is treated by full dilatation of the urethra, together with direct medication of the endovesical mucous membrane through the then sufficiently patulous canal. It is stated that vesical calculi in women can be removed either by lithotomy or lithotrity. No choice is expressed as to the method.

The author holds that "the most rational explanation of the symptoms of vaginismus is to be found in the hysterical temperament of those thus affected, although in some cases there is also present an abnormal condition of the pudic nerve, one branch of which runs along with the artery to the clitoris, whilst the other, or superficial perineal nerve, is distributed to the perineum and labia, in which its terminal branches ramify freely." This throws a flood of light upon the whole subject, and leads those who have cured these cases by attention directed to fissures or ulceration in the anus or at the neck of the bladder to consider whether such cures are not the result of operation *per se* rather than the remedying of sources of reflex irritation. The author advises in the treatment of these cases forcible mechanical expansion of the vaginal canal. If this fails, removal of the hymen.

In considering the operative treatment of fibroid tumor, the author holds that laparo-hysterectomy should never be performed merely to relieve the patient of a fibroid tumor which does not affect her general health, and is merely inconvenient or unsightly. The nearer the menopause the less likely is the fibroid to grow or cause trouble, and therefore, other things being equal, the less likely to call for active operative interference. In citing this opinion he quotes directly, with due credit, from Mundé.

In regard to the use of electricity, he holds that in the checking of hemorrhage it is satisfactory, but that he has seen in no instance subsidence of the tumor, although in several of the cases its apparent bulk became diminished. The operative treatment of malignant disease of the uterus is reviewed at length.

The third part of the book deals with various displacements of the uterus and the mechanical and operative means of remedying them. The subject-matter of this section seems extremely sensible, and is open only to the objection that the author is somewhat discursive, not clearly indicating what are his own preferences in individual cases.

Part IV. is devoted to Diseases of the Uterine Appendages. Part V. to Menstruation and its Disorders. Then follow the Diseases and Abnormalities of Pregnancy.

It is satisfactory to find in this work many cuts of instruments the outlines of which are not obscured by the name of the maker. The illustrations are excellent, the matter is presented in a readable form, and though the work is not destined to supplement our standard text-books on this subject, it represents the practical teaching of a conscientious and experienced specialist.